CHAPTER

73

ENGINE FUEL AND CONTROL

(CFM56 ENGINES (CFM56-7))

BOEING

737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 73
ENGINE FUEL AND CONTROL

Subject/Page	Date	COC
73-EFFECTIVE PAGES		
1 thru 5	Oct 15/2021	
6	BLANK	
73-CONTENTS		
1	Jun 15/2020	
2	Oct 15/2016	
3	Feb 15/2017	
O 4	Oct 15/2021	
5	Jun 15/2021	
6	Oct 15/2020	
7	Jun 15/2021	
8	BLANK	
73-00-00		
901	Oct 15/2019	
902	Oct 15/2014	
903	Oct 15/2019	
904	Jun 15/2020	
905	Oct 15/2019	
906	Oct 15/2014	
73-11-01		
201	Jun 15/2021	
202	Oct 15/2020	
73-11-01		
401	Jun 15/2019	
402	Oct 15/2019	
403	Jun 15/2020	
404	Oct 15/2017	
405	Oct 15/2017	
406	Oct 15/2017	
407	Jun 15/2019	
408	Jun 15/2019	
409	Jun 15/2020	
410	Jun 15/2020	
411	Oct 15/2017	
412	Feb 15/2019	
413	Feb 15/2019	
414	Feb 15/2019	
415	Feb 15/2019	
73-11-01 (cont)		
416	Feb 15/2019	
417	Jun 15/2019	
418	Jun 15/2019	
419	Feb 15/2019	
420	Feb 15/2019	
421	Feb 15/2019	
422	Jun 15/2021	
423	Jun 15/2019	
424	Jun 15/2019	
425	Oct 15/2020	
426	Oct 15/2020	
427	Oct 15/2020	
428	Oct 15/2020	
429	Oct 15/2020	
430	Oct 15/2020	
431	Oct 15/2020	
432	Oct 15/2020	
433	Oct 15/2020	
434	Oct 15/2020	
435	Oct 15/2020	
436	Feb 15/2020	
73-11-01		
601	Oct 15/2019	
602	Feb 15/2018	
603	Oct 15/2014	
604	Jun 15/2016	
73-11-02		
401	Jun 15/2020	
402	Oct 15/2020	
403	Jun 15/2020	
404	Jun 15/2020	
405	Jun 15/2020	
406	Jun 15/2020	
407	Jun 15/2020	
408	Jun 15/2020	
409	Jun 15/2020	
410	Jun 15/2020	
73-11-02 (cont)		
411	Jun 15/2020	
412	Jun 15/2020	
413	Jun 15/2020	
414	Jun 15/2020	
415	Jun 15/2021	
416	Feb 15/2021	
417	Feb 15/2021	
418	Feb 15/2021	
419	Feb 15/2021	
420	Feb 15/2021	
421	Feb 15/2021	
422	Jun 15/2020	
73-11-03		
401	Oct 15/2018	
402	Oct 15/2018	
403	Oct 15/2018	
404	Jun 15/2021	
405	Oct 15/2020	
406	Oct 15/2018	
73-11-04 Config 1		
401	Jun 15/2015	
402	Oct 15/2017	
403	Oct 15/2017	
R 404	Oct 15/2021	
405	Oct 15/2017	
406	Oct 15/2017	
407	Oct 15/2017	
408	Oct 15/2017	
409	Oct 15/2017	
410	Oct 15/2017	
411	Oct 15/2017	
412	Oct 15/2017	
413	Oct 15/2017	
414	Oct 15/2017	
415	Oct 15/2017	
416	Oct 15/2017	
417	Oct 15/2017	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

73-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

Subject/Page	Date	COC
73-11-04 Config 1 (cont)		
418	Oct 15/2017	
419	Oct 15/2017	
420	Oct 15/2017	
421	Oct 15/2017	
422	Jun 15/2016	
423	Jun 15/2016	
424	Jun 15/2016	
425	Jun 15/2016	
426	Jun 15/2016	
427	Jun 15/2016	
428	Jun 15/2016	
429	Jun 15/2016	
430	Jun 15/2016	
431	Jun 15/2016	
432	Jun 15/2016	
433	Jun 15/2016	
434	Jun 15/2016	
435	Jun 15/2016	
436	Jun 15/2016	
437	Jun 15/2021	
438	Oct 15/2020	
439	Oct 15/2020	
R 440	Oct 15/2021	
O 441	Oct 15/2021	
O 442	Oct 15/2021	
O 443	Oct 15/2021	
O 444	Oct 15/2021	
O 445	Oct 15/2021	
O 446	Oct 15/2021	
O 447	Oct 15/2021	
O 448	Oct 15/2021	
O 449	Oct 15/2021	
O 450	Oct 15/2021	
O 451	Oct 15/2021	
O 452	Oct 15/2021	
O 453	Oct 15/2021	
73-11-04 Config 1 (cont)		
O 454	Oct 15/2021	
O 455	Oct 15/2021	
O 456	Oct 15/2021	
73-11-04 Config 2		
401	Jun 15/2015	
402	Oct 15/2017	
403	Oct 15/2017	
404	Oct 15/2017	
405	Oct 15/2017	
406	Oct 15/2017	
407	Oct 15/2017	
408	Oct 15/2017	
409	Oct 15/2017	
410	Oct 15/2017	
411	Oct 15/2017	
412	Jun 15/2016	
413	Jun 15/2016	
414	Jun 15/2016	
415	Jun 15/2016	
416	Jun 15/2016	
417	Jun 15/2016	
418	Jun 15/2016	
419	Jun 15/2016	
420	Jun 15/2016	
421	Jun 15/2016	
422	Jun 15/2016	
423	Jun 15/2016	
424	Jun 15/2016	
425	Jun 15/2016	
426	Jun 15/2021	
427	Oct 15/2020	
428	Oct 15/2020	
429	Oct 15/2020	
430	Oct 15/2020	
431	Oct 15/2020	
432	Oct 15/2020	
73-11-04 Config 2 (cont)		
433	Oct 15/2020	
434	Oct 15/2020	
435	Oct 15/2020	
436	Oct 15/2020	
437	Oct 15/2020	
438	Feb 15/2020	
73-11-04		
601	Oct 15/2019	
602	Oct 15/2017	
603	Oct 15/2017	
604	Jun 15/2019	
605	Oct 15/2017	
606	Oct 15/2017	
73-11-05		
601	Jun 15/2019	
602	Jun 15/2017	
603	Jun 15/2019	
604	Oct 15/2017	
605	Jun 15/2016	
606	Jun 15/2016	
73-11-06		
401	Feb 15/2021	
402	Feb 15/2021	
403	Feb 15/2021	
404	Feb 15/2021	
405	Jun 15/2016	
406	Jun 15/2016	
407	Jun 15/2016	
408	Jun 15/2021	
409	Jun 15/2021	
410	Jun 15/2021	
411	Jun 15/2021	
412	BLANK	
73-11-07		
401	Jun 15/2021	
402	Jun 15/2021	
403	Jun 15/2021	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

73-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

Subject/Page	Date	COC
73-11-07 (cont)		
404	Jun 15/2021	
405	Jun 15/2021	
406	Oct 15/2016	
407	Oct 15/2016	
408	Oct 15/2016	
409	Oct 15/2016	
410	Oct 15/2016	
R 411	Oct 15/2021	
O 412	Oct 15/2021	
413	Oct 15/2020	
R 414	Oct 15/2021	
415	Oct 15/2020	
416	Oct 15/2019	
73-11-08		
401	Oct 15/2016	
402	Oct 15/2017	
403	Jun 15/2016	
404	Jun 15/2021	
405	Feb 15/2021	
406	BLANK	
73-11-10		
R 401	Oct 15/2021	
R 402	Oct 15/2021	
R 403	Oct 15/2021	
404	Jun 15/2016	
405	Jun 15/2016	
406	Jun 15/2016	
407	Jun 15/2016	
R 408	Oct 15/2021	
409	Feb 15/2021	
R 410	Oct 15/2021	
411	Feb 15/2021	
412	BLANK	
73-11-11		
401	Jun 15/2019	
402	Oct 15/2019	
403	Oct 15/2017	

Subject/Page	Date	COC
73-11-11 (cont)		
404	Oct 15/2017	
405	Oct 15/2017	
406	Feb 15/2017	
407	Feb 15/2017	
408	Feb 15/2017	
409	Jun 15/2019	
410	Jun 15/2019	
411	Jun 15/2019	
412	Jun 15/2021	
413	Jun 15/2019	
414	Oct 15/2020	
415	Jun 15/2019	
416	Oct 15/2020	
417	Jun 15/2019	
418	Jun 15/2019	
73-21-00		
501	Feb 15/2015	
502	Jun 15/2019	
503	Jun 15/2019	
504	Oct 15/2014	
505	Jun 15/2016	
506	Oct 15/2014	
507	Jun 15/2019	
508	Oct 15/2014	
509	Jun 15/2015	
510	Oct 15/2014	
511	Oct 15/2014	
512	Jun 15/2019	
513	Jun 15/2019	
514	Oct 15/2014	
515	Oct 15/2019	
516	Jun 15/2019	
517	Oct 15/2014	
518	Jun 15/2019	
519	Jun 15/2019	
520	Jun 15/2019	

Subject/Page	Date	COC
73-21-00 (cont)		
521	Jun 15/2018	
522	Jun 15/2019	
523	Jun 15/2018	
524	Jun 15/2019	
525	Jun 15/2018	
526	Jun 15/2019	
527	Jun 15/2018	
528	Feb 15/2020	
529	Oct 15/2019	
530	Jun 15/2018	
531	Jun 15/2018	
532	Jun 15/2018	
533	Jun 15/2018	
534	Jun 15/2019	
535	Jun 15/2018	
536	Jun 15/2018	
73-21-02		
401	Jun 15/2015	
402	Oct 15/2017	
403	Oct 15/2014	
404	Jun 15/2016	
405	Jun 15/2016	
406	Jun 15/2021	
407	Oct 15/2017	
408	Oct 15/2017	
73-21-05		
401	Oct 15/2014	
402	Oct 15/2014	
403	Jun 15/2016	
404	Jun 15/2021	
405	Oct 15/2020	
406	BLANK	
73-21-05		
601	Feb 15/2015	
602	Oct 15/2014	
603	Jun 15/2016	
604	BLANK	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

73-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

Subject/Page	Date	COC
73-21-06		
401	Jun 15/2015	
402	Oct 15/2014	
403	Oct 15/2014	
404	Jun 15/2016	
405	Jun 15/2016	
406	Jun 15/2016	
407	Jun 15/2016	
408	Jun 15/2016	
409	Jun 15/2016	
410	Jun 15/2016	
411	Jun 15/2016	
412	Jun 15/2016	
413	Jun 15/2016	
414	Jun 15/2016	
415	Jun 15/2021	
416	Oct 15/2020	
417	Oct 15/2020	
R 418	Oct 15/2021	
R 419	Oct 15/2021	
R 420	Oct 15/2021	
R 421	Oct 15/2021	
R 422	Oct 15/2021	
423	Oct 15/2020	
424	Jun 15/2021	
425	Jun 15/2021	
426	Oct 15/2020	
427	Oct 15/2020	
428	Jun 15/2021	
429	Jun 15/2021	
430	Oct 15/2020	
431	Oct 15/2020	
432	Oct 15/2020	
433	Oct 15/2020	
R 434	Oct 15/2021	
R 435	Oct 15/2021	
R 436	Oct 15/2021	

Subject/Page	Date	COC
73-21-06 (cont)		
R 437	Oct 15/2021	
R 438	Oct 15/2021	
O 439	Oct 15/2021	
O 440	Oct 15/2021	
O 441	Oct 15/2021	
O 442	Oct 15/2021	
O 443	Oct 15/2021	
O 444	Oct 15/2021	
O 445	Oct 15/2021	
O 446	Oct 15/2021	
O 447	Oct 15/2021	
O 448	Oct 15/2021	
A 449	Oct 15/2021	
A 450	BLANK	
73-21-06		
801	Oct 15/2017	
802	Oct 15/2017	
803	Jun 15/2016	
804	Jun 15/2016	
73-21-07		
401	Oct 15/2014	
402	Oct 15/2020	
403	Oct 15/2020	
404	Oct 15/2020	
405	Oct 15/2020	
406	Jun 15/2021	
407	Oct 15/2020	
408	Oct 15/2020	
73-21-08		
R 401	Oct 15/2021	
R 402	Oct 15/2021	
403	Oct 15/2017	
R 404	Oct 15/2021	
R 405	Oct 15/2021	
R 406	Oct 15/2021	

Subject/Page	Date	COC
73-21-09		
201	Jun 15/2021	
202	Jun 15/2015	
203	Jun 15/2016	
204	Feb 15/2015	
205	Jun 15/2016	
206	Jun 15/2016	
207	Jun 15/2016	
208	Jun 15/2016	
209	Jun 15/2016	
210	Jun 15/2015	
211	Feb 15/2015	
212	Jun 15/2016	
213	Feb 15/2015	
214	Jun 15/2016	
215	Jun 15/2016	
216	Jun 15/2016	
217	Jun 15/2016	
218	Jun 15/2016	
219	Jun 15/2016	
220	BLANK	
73-21-10		
201	Feb 15/2015	
202	BLANK	
73-21-10		
401	Jun 15/2021	
402	Jun 15/2020	
403	Jun 15/2020	
404	Jun 15/2020	
405	Jun 15/2020	
406	Jun 15/2020	
407	Oct 15/2017	
408	Oct 15/2017	
409	Oct 15/2017	
410	Oct 15/2017	
411	Oct 15/2017	
412	Oct 15/2017	
413	Jun 15/2021	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

73-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

Subject/Page	Date	COC
73-21-10 (cont)		
414	Oct 15/2019	
415	Oct 15/2020	
416	Jun 15/2020	
417	Oct 15/2020	
418	Oct 15/2020	
419	Oct 15/2020	
420	Oct 15/2020	
421	Jun 15/2020	
422	Jun 15/2020	
73-21-12		
401	Oct 15/2014	
402	Jun 15/2016	
403	Oct 15/2014	
404	Oct 15/2014	
73-21-60		
201	Feb 15/2021	
R 202	Oct 15/2021	
R 203	Oct 15/2021	
R 204	Oct 15/2021	
O 205	Oct 15/2021	
O 206	Oct 15/2021	
O 207	Oct 15/2021	
O 208	Oct 15/2021	
O 209	Oct 15/2021	
O 210	Oct 15/2021	
O 211	Oct 15/2021	
O 212	Oct 15/2021	
213	Feb 15/2021	
214	Feb 15/2021	
215	Oct 15/2020	
216	Oct 15/2020	
217	Feb 15/2021	
218	Oct 15/2020	
219	Oct 15/2020	
220	Feb 15/2021	
221	Feb 15/2021	
222	Oct 15/2020	
73-21-60 (cont)		
223	Feb 15/2021	
224	Oct 15/2020	
225	Oct 15/2020	
226	Oct 15/2020	
227	Oct 15/2020	
228	BLANK	
73-21-60		
401	Oct 15/2020	
R 402	Oct 15/2021	
403	Oct 15/2020	
404	Oct 15/2020	
405	Oct 15/2020	
406	Oct 15/2020	
407	Oct 15/2020	
R 408	Oct 15/2021	
R 409	Oct 15/2021	
410	Oct 15/2020	
73-21-61		
401	Jun 15/2015	
402	Oct 15/2014	
403	Jun 15/2016	
404	Oct 15/2020	
405	Oct 15/2020	
406	BLANK	
73-21-61		
501	Feb 15/2021	
502	Feb 15/2021	
503	Feb 15/2021	
504	Feb 15/2021	
505	Jun 15/2016	
506	Oct 15/2015	
73-21-70		
401	Oct 15/2014	
402	Oct 15/2017	
403	Jun 15/2016	
404	Jun 15/2021	
405	Oct 15/2019	
73-21-70 (cont)		
406	BLANK	
73-31-01		
401	Jun 15/2021	
402	Jun 15/2021	
403	Jun 15/2021	
404	Jun 15/2021	
405	Jun 15/2021	
406	Jun 15/2021	
407	Jun 15/2021	
408	Jun 15/2021	
73-34-01		
401	Jun 15/2017	
402	Oct 15/2017	
403	Jun 15/2017	
404	Jun 15/2021	
405	Jun 15/2021	
406	Oct 15/2017	
407	Oct 15/2017	
408	BLANK	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

73-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
ENGINE FUEL AND CONTROL - DDG MAINTENANCE PROCEDURES	73-00-00		901	IDC ALL
MMEL 73-10 (DDPG) Preparation - Fuel Control, ENG VALVE CLOSED Indicating System TASK 73-00-00-040-801-F00			901	IDC ALL
MMEL 73-10 (DDPG) Restoration - Fuel Control, ENG VALVE CLOSED Indicating System TASK 73-00-00-040-802-F00			903	IDC ALL
MMEL 73-4 (DDPG) - Fuel Filter Differential Pressure Warning System TASK 73-00-00-200-801-F00			904	IDC ALL
MMEL 73-12 (DDPG) Preparation - EEC Alternate Power Supply System Inoperative TASK 73-00-00-040-803-F00			904	IDC ALL
MMEL 73-12 (DDPG) Restoration - EEC Alternate Power Supply System Inoperative TASK 73-00-00-440-801-F00			905	IDC ALL
FUEL PUMP PACKAGE - MAINTENANCE PRACTICES	73-11-01		201	IDC ALL
Fuel Pump Preservation TASK 73-11-01-600-801-F00			201	IDC ALL
FUEL PUMP PACKAGE - REMOVAL/INSTALLATION	73-11-01		401	IDC ALL
Fuel Pump Package Removal TASK 73-11-01-000-801-F00			401	IDC ALL
Fuel Pump Package Installation TASK 73-11-01-400-801-F00			422	IDC ALL
FUEL PUMP PACKAGE - INSPECTION/CHECK	73-11-01		601	IDC ALL
The Visual Inspection of the Impeller Rotation TASK 73-11-01-200-801-F00			601	IDC ALL
FUEL FILTER - REMOVAL/INSTALLATION	73-11-02		401	IDC ALL
Fuel Filter - Removal TASK 73-11-02-000-801-F00			401	IDC ALL
Fuel Filter - Installation TASK 73-11-02-400-801-F00			415	IDC ALL

73-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
FUEL NOZZLE FILTER - REMOVAL/INSTALLATION	73-11-03		401	IDC ALL
Fuel Nozzle Filter Removal (SAC) TASK 73-11-03-000-802-F00			401	IDC ALL
Fuel Nozzle Filter Installation (SAC) TASK 73-11-03-400-802-F00			404	IDC ALL
FUEL NOZZLES/NO BSV INSTALLED - REMOVAL/INSTALLATION	73-11-04	1	401	IDC ALL POST SB CFM56-7B 73-44
Fuel Nozzle Removal TASK 73-11-04-000-805-F01		1	401	IDC ALL POST SB CFM56-7B 73-44
Fuel Nozzle Installation TASK 73-11-04-400-805-F01		1	437	IDC ALL POST SB CFM56-7B 73-44
FUEL NOZZLES/BSV INSTALLED - REMOVAL/INSTALLATION	73-11-04	2	401	IDC ALL PRE SB CFM56-7B 73-44
Fuel Nozzle Removal TASK 73-11-04-000-804-F02		2	401	IDC ALL PRE SB CFM56-7B 73-44
Fuel Nozzle Installation TASK 73-11-04-400-804-F02		2	426	IDC ALL PRE SB CFM56-7B 73-44
FUEL NOZZLES - INSPECTION/CHECK	73-11-04		601	IDC ALL
Fuel Nozzle and Fuel Manifold Leak Check TASK 73-11-04-200-801-F00			601	IDC ALL
FUEL MANIFOLD - INSPECTION/CHECK	73-11-05		601	IDC ALL
Fuel Manifold - Inspection/Check TASK 73-11-05-700-801-F00			601	IDC ALL
IDG OIL COOLER - REMOVAL/INSTALLATION	73-11-06		401	IDC ALL
IDG Oil Cooler Removal TASK 73-11-06-000-801-F00			401	IDC ALL
IDG Oil Cooler Installation TASK 73-11-06-400-801-F00			408	IDC ALL
SERVO FUEL HEATER - REMOVAL/INSTALLATION	73-11-07		401	IDC ALL
Servo Fuel Heater Removal TASK 73-11-07-000-801-F00			401	IDC ALL
Servo Fuel Heater Installation TASK 73-11-07-400-801-F00			411	IDC ALL

73-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
BURNER STAGING VALVE - REMOVAL/INSTALLATION	73-11-08		401	IDC ALL
Burner Staging Valve Removal TASK 73-11-08-000-801-F00			401	IDC ALL
Burner Staging Valve Installation TASK 73-11-08-400-801-F00			404	IDC ALL
FUEL SUPPLY HOSE - REMOVAL/INSTALLATION	73-11-10		401	IDC ALL
Fuel Supply Hose Removal TASK 73-11-10-000-801-F00			401	IDC ALL
Fuel Supply Hose Installation TASK 73-11-10-400-801-F00			408	IDC ALL
FUEL PUMP - REMOVAL/INSTALLATION	73-11-11		401	IDC ALL
Fuel Pump Removal TASK 73-11-11-000-801-F00			401	IDC ALL
Fuel Pump Installation TASK 73-11-11-400-801-F00			412	IDC ALL
FUEL CONTROL SYSTEM - ADJUSTMENT/TEST	73-21-00		501	IDC ALL
EEC BITE TEST - RECENT FAULTS TASK 73-21-00-740-803-F00			501	IDC ALL
EEC BITE TEST - FAULT HISTORY TASK 73-21-00-740-801-F00			506	IDC ALL
Prepare for the Tests TASK 73-21-00-840-801-F00			509	IDC ALL
FADEC System Test TASK 73-21-00-700-802-F00			511	IDC ALL
EEC TEST TASK 73-21-00-700-804-F00			512	IDC ALL
T/R LEVER INTLK (Interlock) TEST TASK 73-21-00-700-805-F00			515	IDC ALL
Thrust Lever Adjustment and Thrust Reverser Position Adjustment Test TASK 73-21-00-700-806-F00			519	IDC ALL
Engine 1 and Engine 2 Thrust Lever Angle Resolver Alignment Test TASK 73-21-00-700-807-F00			522	IDC ALL

73-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
IDENT/CONFIG TASK 73-21-00-700-808-F00			526	IDC ALL
EEC Discretes Test TASK 73-21-00-700-809-F00			529	IDC ALL
Erase All EEC Faults TASK 73-21-00-800-801-F00			534	IDC ALL
FADEC 2 or FADEC 3 Identification TASK 73-21-00-700-810-F00			535	IDC ALL
PT25 SENSOR - REMOVAL/INSTALLATION	73-21-02		401	IDC ALL
PT25 Sensor Removal TASK 73-21-02-000-801-F00			401	IDC ALL
PT25 Sensor Installation TASK 73-21-02-400-801-F00			406	IDC ALL
T12 SENSOR - REMOVAL/INSTALLATION	73-21-05		401	IDC ALL
T12 Sensor Removal TASK 73-21-05-000-801-F00			401	IDC ALL
T12 Sensor Installation TASK 73-21-05-400-801-F00			404	IDC ALL
T12 SENSOR - INSPECTION/CHECK	73-21-05		601	IDC ALL
T12 Sensor Inspection/Check TASK 73-21-05-200-801-F00			601	IDC ALL
WIRING HARNESSES - REMOVAL/INSTALLATION	73-21-06		401	IDC ALL
Fan Wiring Harness Removal TASK 73-21-06-000-801-F00			401	IDC ALL
Fan Wiring Harness Installation TASK 73-21-06-400-801-F00			415	IDC ALL
3 O'clock Strut Harness Removal TASK 73-21-06-000-802-F00			418	IDC ALL
3 O'clock Strut Harness Installation TASK 73-21-06-400-802-F00			434	IDC ALL
Core Engine Harness Removal TASK 73-21-06-000-803-F00			439	IDC ALL
Core Engine Harness Installation TASK 73-21-06-400-803-F00			447	IDC ALL

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
WIRING HARNESSES - REPAIR	73-21-06		801	IDC ALL
Repair of Worn CJ9 and CJ10 Wiring Harnesses TASK 73-21-06-300-801-F00			801	IDC ALL
Repair of the Heat-Shrinkable Sleeves TASK 73-21-06-300-802-F00			801	IDC ALL
T3 SENSOR - REMOVAL/INSTALLATION	73-21-07		401	IDC ALL
T3 Sensor Removal TASK 73-21-07-000-801-F00			401	IDC ALL
T3 Sensor Installation TASK 73-21-07-400-801-F00			406	IDC ALL
ELECTRONIC ENGINE CONTROL (EEC) ALTERNATOR - REMOVAL/INSTALLATION	73-21-08		401	IDC ALL
EEC Alternator and Alternator Rotor Removal TASK 73-21-08-000-801-F00			401	IDC ALL
EEC Alternator and Alternator Rotor Installation TASK 73-21-08-400-801-F00			404	IDC ALL
HIGH PRESSURE SHUTOFF VALVE (HPSOV) - MAINTENANCE PRACTICES	73-21-09		201	IDC ALL
High Pressure Shutoff Valve (HPSOV) Switch Removal TASK 73-21-09-000-801-F00			201	IDC ALL
High Pressure Shutoff Valve (HPSOV) Switch Installation TASK 73-21-09-400-801-F00			210	IDC ALL
HYDROMECHANICAL UNIT - MAINTENANCE PRACTICES	73-21-10		201	IDC ALL
HMU Inspection TASK 73-21-10-200-801-F00			201	IDC ALL
HYDROMECHANICAL UNIT - REMOVAL/INSTALLATION	73-21-10		401	IDC ALL
HMU Removal TASK 73-21-10-000-801-F00			401	IDC ALL
HMU Installation TASK 73-21-10-400-801-F00			413	IDC ALL

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
ENGINE CONTROL MODULE - REMOVAL/INSTALLATION	73-21-12		401	IDC ALL
Engine Control Module Removal TASK 73-21-12-000-801-F00			401	IDC ALL
Engine Control Module Installation TASK 73-21-12-400-801-F00			403	IDC ALL
ELECTRONIC ENGINE CONTROL - MAINTENANCE PRACTICES	73-21-60		201	IDC ALL
EEC Software Load TASK 73-21-60-470-801-F00			201	IDC ALL
Retrieve NVM TASK 73-21-60-970-801-F00			221	IDC ALL
ELECTRONIC ENGINE CONTROL - REMOVAL/INSTALLATION	73-21-60		401	IDC ALL
EEC Removal TASK 73-21-60-000-801-F00			401	IDC ALL
EEC Installation TASK 73-21-60-400-801-F00			408	IDC ALL
IDENTIFICATION PLUG - REMOVAL/INSTALLATION	73-21-61		401	IDC ALL
Identification Plug Removal TASK 73-21-61-000-801-F00			401	IDC ALL
Identification Plug Installation TASK 73-21-61-400-801-F00			404	IDC ALL
IDENTIFICATION PLUG - ADJUSTMENT/TEST	73-21-61		501	IDC ALL
Identification Plug Configuration TASK 73-21-61-800-801-F00			501	IDC ALL
HPTCC SENSOR - REMOVAL/INSTALLATION	73-21-70		401	IDC ALL PRE SB CFM56-7B-72-0340
HPTCC Sensor Removal TASK 73-21-70-010-801-F00			401	IDC ALL PRE SB CFM56-7B-72-0340
HPTCC Sensor Installation TASK 73-21-70-400-801-F00			404	IDC ALL PRE SB CFM56-7B-72-0340

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CHAPTER 73
ENGINE FUEL AND CONTROL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
FUEL FLOW TRANSMITTER - REMOVAL/INSTALLATION	73-31-01		401	IDC ALL
Fuel Flow Transmitter Removal TASK 73-31-01-000-801-F00			401	IDC ALL
Fuel Flow Transmitter Installation TASK 73-31-01-400-801-F00			406	IDC ALL
FUEL FILTER DIFFERENTIAL PRESSURE SWITCH OR FUEL FILTER CLOGGING INDICATOR - REMOVAL/INSTALLATION	73-34-01		401	IDC ALL
Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal TASK 73-34-01-000-801-F00			401	IDC ALL
Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation TASK 73-34-01-400-801-F00			405	IDC ALL

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

ENGINE FUEL AND CONTROL - DDG MAINTENANCE PROCEDURES

1. General

A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDPG). These tasks prepare the airplane for flight with systems/components that are inoperative.

B. This procedure also has the tasks that put the airplane back to its usual condition.

C. These are the tasks for the components in the engine fuel and control system:

(1) MMEL 73-10 (DDPG) Preparation - Fuel Control, ENG VALVE CLOSED Indicating System.

(2) MMEL 73-10 (DDPG) Restoration - Fuel Control, ENG VALVE CLOSED Indicating System.

(3) MMEL 73-4 (DDPG) Verify the Fuel Filter Differential Pressure Warning System.

(4) MMEL 73-12 (DDPG) Preparation - EEC Alternate Power Supply System Inoperative.

(5) MMEL 73-12 (DDPG) Restoration - EEC Alternate Power Supply System Inoperative.

TASK 73-00-00-040-801-F00

2. MMEL 73-10 (DDPG) Preparation - Fuel Control, ENG VALVE CLOSED Indicating System

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the Engine Valve Closed light inoperative.

(2) This is the condition for this task:

(a) The two ENG VALVE CLOSED lights may be inoperative provided that the High Pressure ShutOff Valves (HPSOV) will operate correctly.

B. References

Reference	Title
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Engine Fuel HPSOV Operational Test

SUBTASK 73-00-00-860-001-F00

(1) Do these steps to make sure that the HPSOV operates correctly:

(a) Start the applicable engine, do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.

1) Let the engine become stable at idle.

(b) For Engine 1, open this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) For Engine 2, open this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

(d) Put the applicable the start lever to the CUTOFF position.

(e) Make sure that the engine immediately begins to decelerate and continues to decelerate at the usual rate to a complete stop.

NOTE: If the engine does not immediately begin to decelerate, then there is a problem in the HPSOV system.

1) If the engine does not decelerate correctly, then do these steps:

a) For Engine 1, close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

b) For Engine 2, close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

c) Do the fault isolation for fault code 730 050 51 (Eng 1) or 730 050 52 (Eng 2).

(f) Make sure that the Start Lever is in the CUTOFF position.

(g) For Engine 1, close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

(h)

For Engine 2, close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

SUBTASK 73-00-00-860-002-F00

(2) For Engine 1, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

SUBTASK 73-00-00-860-003-F00

(3) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-00-00-040-802-F00

3. MMEL 73-10 (DDPG) Restoration - Fuel Control, ENG VALVE CLOSED Indicating System

A. General

(1) This task puts the airplane back to its usual condition after operation with the ENG VALVE CLOSED Light, LX1, inoperative.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. ENG VALVE CLOSED Light Repair

SUBTASK 73-00-00-860-004-F00

(1) For engine 1, do this step;

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

SUBTASK 73-00-00-860-005-F00

(2) For engine 2, do this step;

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND

SUBTASK 73-00-00-810-001-F00

(3) Do these steps to correct the fault:

(a) Find the fault code, or the description of the fault that occurred.

(b) If you find a fault code, then do these steps:

1) Go to the Fault Code Index in the applicable chapter of the FIM, and find the fault code.

NOTE: The first two digits of the fault code are the FIM chapter.

2) Find the task number on the same line as the fault code.

3) Go to the task in the FIM and do the steps in the task.

(c) If you find a description of the fault, then do these steps:

1) Go to the Observed Fault List at the start of the FIM, and find the best description for the fault.

2) Find the task number on the same line as the fault description.

3) Go to the task in the FIM, and do the steps in the task.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-00-00-200-801-F00

4. MMEL 73-4 (DDPG) - Fuel Filter Differential Pressure Warning System

A. General

(1) This task gives the maintenance steps when the fuel filter differential pressure warning system is inoperative.

B. References

Reference	Title
73-11-02-000-801-F00	Fuel Filter - Removal (P/B 401)
73-11-02-400-801-F00	Fuel Filter - Installation (P/B 401)
73-21-00-700-804-F00	EEC TEST (P/B 501)
73-21-00-740-803-F00	EEC BITE TEST - RECENT FAULTS (P/B 501)

C. Procedure

SUBTASK 73-00-00-200-001-F00

(1) Make sure that the malfunction is in the fuel filter bypass warning system.

(a) If the FILTER BYPASS light comes ON with the engine not in operation, the fuel filter bypass warning system is faulty. Continue to the step to replace the fuel filter.

NOTE: To energize the system with the engine not in operation, put the Engine START Switch to the CONT position.

(b) If the FILTER BYPASS light does not come ON with the engine not in operation, do these steps:

1) If the FILTER BYPASS light comes ON before engine shutdown, do this task EEC BITE TEST - RECENT FAULTS, TASK 73-21-00-740-803-F00. Look for fault messages on Fuel Filter Signals Disagree.

a) If you find the fault message, continue to the step to replace the fuel filter.

2) If the FILTER BYPASS light is inoperative OFF, do this task, EEC TEST, TASK 73-21-00-700-804-F00.

NOTE: The other indication lights in the EEC test must come on as usual.

SUBTASK 73-00-00-900-001-F00

(2) Replace the fuel filter. Do these tasks: Fuel Filter - Removal, TASK 73-11-02-000-801-F00 and Fuel Filter - Installation, TASK 73-11-02-400-801-F00.

NOTE: For Non-ER operations, one flight is permitted before filter replacement only if the fuel drained from filter housing drain plug is free of visible gross contamination.

——— END OF TASK ———

TASK 73-00-00-040-803-F00

5. MMEL 73-12 (DDPG) Preparation - EEC Alternate Power Supply System Inoperative

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the EEC Alternate Power Supply System inoperative.

(2) Dispatch is not allowed with ENGINE CONTROL light(s) illuminated or inoperative.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

Zone	Area
212	Flight Compartment - Right

C. EEC Alternate Power Supply System Deactivation

SUBTASK 73-00-00-040-001-F00

(1) For Engine 1, channel A:

(a) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(2) For Engine 1, channel B:

(a) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

SUBTASK 73-00-00-040-002-F00

(3) For Engine 2, channel A:

(a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(4) For Engine 2, channel B:

(a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B

——— END OF TASK ———

TASK 73-00-00-440-801-F00

6. MMEL 73-12 (DDPG) Restoration - EEC Alternate Power Supply System Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with a EEC Alternate Power Supply System inoperative.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. EEC Alternate Power Supply System Activation

SUBTASK 73-00-00-440-001-F00

(1) For Engine 1, channel A:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(2) For Engine 1, channel B:

(a) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

SUBTASK 73-00-00-440-002-F00

(3) For Engine 2, channel A:

(a) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(4) For Engine 2, channel B:

(a) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL PUMP PACKAGE - MAINTENANCE PRACTICES

1. General

A. This procedure contains one task:

(1) The preservation of the fuel pump.

TASK 73-11-01-600-801-F00

2. Fuel Pump Preservation

A. General

(1) Do this procedure when you send a fuel pump to storage.

B. References

Reference	Title
73-11-01-000-801-F00	Fuel Pump Package Removal (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2338	Adapter - Drive Spline, Fuel Pump Part #: 856A3471P02 Supplier: 58828

D. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236

E. Fuel Pump Preservation

SUBTASK 73-11-01-620-001-F00

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

WARNING DO NOT LET THE ENGINE FUEL STAY ON YOUR SKIN. FLUSH THE FUEL FROM YOUR SKIN WITH WATER. THE FUEL IS POISONOUS AND CAN BE ABSORBED INTO YOUR BODY.

(1) Do these steps to preserve the fuel pump with oil, D00623 [CP5066] or vaseline, D00672 [CP5070]:

NOTE: You can not do this procedure if the fuel pump is installed on the engine. Refer to this task (TASK 73-11-01-000-801-F00) to remove the fuel pump.

(a) Make sure that the oil that you use for the procedure is clean.

NOTE: If it is necessary, put the oil through a 10 micron filter to clean it.

(b) Pour the oil into the inlet port of the pump.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Use the adapter, SPL-2338 to turn the fuel pump main drive shaft until the oil flows out of the discharge port.

(d) Tilt the pump and drain as much of the oil as possible.

(e) Lubricate the splines of the main and control drive shafts with graphite mineral vaseline, D00601 [CP2101].

(f) Install the shipping closures from the replacement fuel pump.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL PUMP PACKAGE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the fuel pump package

(2) The installation of the fuel pump package.

TASK 73-11-01-000-801-F00

2. Fuel Pump Package Removal

(Figure 401, Figure 402, Figure 403, Figure 404 and Figure 405)

A. General

(1) This task provides the instructions on how to remove the fuel pump package.

(2) The fuel pump package is on the engine at the 8:00 o'clock position below the left fan cowl panel.

(3) The fuel pump package is made up of the fuel pump, HMU, fuel filter, main oil/fuel heat exchanger, servo fuel heater, and fuel filter differential pressure switch.

(4) It is easier to complete the procedure if the same size tube connectors are removed and installed at the same time.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
72-63-01-000-801-F00	Handcranking Drive Cover Removal (P/B 201)
73-11-01-600-801-F00	Fuel Pump Preservation (P/B 201)
73-11-07-000-801-F00	Servo Fuel Heater Removal (P/B 401)
73-21-10-000-801-F00	HMU Removal (P/B 401)
73-34-01-000-801-F00	Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal (P/B 401)
79-21-02-000-801-F00	Main Oil/Fuel Heat Exchanger Removal (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2189	Block - Jacking, Fuel Pump, MEC/HMU Part #: 856A2609G01 Supplier: 58828
SPL-2336	Cradle - Support, Fuel Pump and MEC Part #: 856A3598G03 Supplier: 58828
STD-858	Tag - DO NOT OPERATE
STD-1154	Container - 5 Gallon (19 Liter)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Plug	73-11-01-01-060	IDC 001-006
		73-11-01-01A-110	IDC 007-010, 012-999
3	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for Removal

SUBTASK 73-11-01-760-002-F00

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 73-11-01-840-008-F00

(2) Do these steps to prepare the airplane for the removal:

(a) Make sure that the start levers are in the CUTOFF position and install DO NOT OPERATE tags, STD-858.

(b) Make sure that the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

(c) Make sure that the SPAR VALVE CLOSED (fuel spar shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

NOTE: The removal of the electrical power is necessary before the electrical and fluid connectors are disconnected. Electrical power can be reapplied to the airplane after all of the electrical and fluid connectors are disconnected and the protective covers are installed.

(e) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 73-11-01-010-004-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. Fuel Pump Package Removal

SUBTASK 73-11-01-680-002-F00

(1) Do these steps to drain the fuel from the fuel pump package [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

> **WARNING** DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Put a 5 gallon (19 liter) container, STD-1154 below the fuel pump.

(b) Remove the drain plug [2] from the fuel filter cover.

(c) Let the fuel drain in the container.

(d) Remove and discard the O-ring [3] from the drain plug [2].

> **WARNING** DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(e) Lubricate a new O-ring [3] with oil, D00623 [CP5066].

(f) Install the new O-ring [3] on the drain plug [2].

(g) Lubricate the threads of the drain plug [2] with oil, D00623 [CP5066].

(h) Install the drain plug [2].

1) Tighten the drain plug [2] to a torque of 45.0-55.0 pound-inches (5.0-6.2 Newton-meters).

(i) Install the safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the drain plug [2].

SUBTASK 73-11-01-020-012-F00

(2) Do this task: Handcranking Drive Cover Removal, TASK 72-63-01-000-801-F00.

SUBTASK 73-11-01-020-013-F00

(3) Disconnect these electrical connectors:

NOTE: If it is necessary, Use soft-nose pliers to turn the connector nuts.

(a) The DP1203 (MW0312) connector from the HMU

(b) The DP0501 (J5) connector from the HMU

(c) The DP1207 (MW0312) connector from the HMU

(d) The DP0601 (J6) connector from the HMU

(e) The DP0803 (J8) connector from the fuel filter differential pressure switch

(f) Install protective covers on the plugs and the receptacles.

1) Move the electrical connectors out of the way to make sure that they are not damaged.

a) If it is necessary, use lockwire or tape to keep the connectors out of the way.

SUBTASK 73-11-01-210-002-F00

(4) Make sure that the container stays below the fuel pump during the removal procedure.

(a) Let the unwanted fuel and oil drain into the container while the fuel pump package [1] is disassembled.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-01-420-004-F00

CAUTION
USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(5) Disconnect these hoses from the HMU (TASK 73-21-10-000-801-F00):

(a) Use two wrenches to disconnect these hoses:

NOTE: The hose removals are arranged so that same wrenches are used at the same time.

1) The HPT hose [5]
2) The BSV hose [10]
3) The TBV hose [12].

(b) Use two wrenches to disconnect these hoses:

1) The LPT hose [4]
2) The VSV hose (ROD) [6]
3) The VBV hose (CLOSED) [8]
4) The PCR hose [11].

(c) Use two wrenches to disconnect these hoses:

1) The VSV hose (HEAD) [7]
2) The VBV hose (OPEN) [9].

(d) Install protective covers on the hoses and the HMU.

1) If it is necessary, use lockwire or tape to keep the hoses out of the way.

SUBTASK 73-11-01-020-014-F00

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

CAUTION
USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(6) Do these steps to remove the oil tube [16] from the fuel pump package [1].

(a) Use two wrenches to disconnect the oil tube [16] from the oil tube [15].

(b) Remove the four bolts [18] that hold the oil tube [16] and the gasket [17] to the servo fuel heater.

(c) Remove the nut [23], bolt [24] and the two clamps [22] that hold the tubes to the fuel pump package [1].

(d) Remove the nut [25], bolt [26]and the clamp [27] that holds the tube to the bracket.

(e) Remove the oil tube [16].

1) If the gasket [17] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) Install protective covers on the oil tube [16] and the servo fuel heater.

SUBTASK 73-11-01-020-015-F00

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(7) Do these steps to disconnect the oil tube [20] from the fuel pump package [1]:

(a) Remove the four bolts [19] that hold the oil tube [20] and the gasket [21] to the servo fuel heater.

(b) Move the oil tube [20] out of the way, to make sure that it is not damaged.

1) If it is necessary, use lockwire or tape to keep the tube out of the way.

2) If the gasket [21] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

(c) Install protective covers on the oil tube [20] and the servo fuel heater.

SUBTASK 73-11-01-020-016-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(8) Do these steps to remove the fuel tube [31] and fuel tube [37] from the fuel pump package [1]:

(a) Use two wrenches to disconnect the fuel tube [31] from the fuel tube [37].

(b) Remove the four bolts [30] that hold the fuel tube [31] and the gasket [32] to the fuel pump package [1].

(c) Remove the nut [40], bolt [41], and clamp [42] that hold the fuel tube [31] to the fuel pump package [1].

(d) Remove the fuel tube [31].

1) If the gasket [32] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

(e) Install protective covers on the fuel tube [31] and the fuel pump package [1].

(f) Use two wrenches to disconnect the fuel tube [37] from the hose [33].

1) If it is necessary, use lockwire or tape to keep the hose [33] out of the way.

(g) Remove the four bolts [39] that hold the fuel tube [37] and the gasket [38] to the fuel pump package [1].

(h) Remove the nut [35],bolt [36], and clamp [34] that hold the fuel tube [37] to the fuel pump package [1].

(i) Remove the fuel tube [37].

1) If the gasket [38] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

(j) Install protective covers on the fuel tube [37], hose [33], and the fuel pump package [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-01-020-017-F00

CAUTION

USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(9) Do these steps to remove the fuel tube [45] and fuel tube [46] from the fuel pump package [1]:

(a) Use two wrenches to disconnect the fuel tube [45] from the servo fuel heater and the fuel pump.

(b) Remove the fuel tube [45].

1) Install protective covers on the fuel tube [45], servo fuel heater, and fuel pump.

(c) Use two wrenches to disconnect the fuel tube [46] from the servo fuel heater.

(d) Remove the four bolts [48] hat hold the fuel tube [46] and the gasket [47] to the fuel pump package [1].

(e) Remove the fuel tube [46].

1) If the gasket [47] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

2) Install protective covers on the fuel tube [46], servo fuel heater, and fuel pump package [1].

SUBTASK 73-11-01-020-018-F00

CAUTION

USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(10) Do these steps to remove the fuel tube [50] and the bracket [53] from the fuel pump package [1]:

(a) Use two wrenches to disconnect the fuel tube [50] from the fuel tube [57].

(b) Remove the four bolts [49] that hold the fuel tube [50] and the gasket [51] to the fuel pump package [1].

(c) Remove the nut [54], bolt [55], and clamp [56] that hold the fuel tube [50] to the fuel pump package [1].

(d) Remove the nut [54], bolt [55], and clamp [56] that hold the fuel tube [57] to the bracket above the fuel pump package [1].

(e) Remove the fuel tube [50] and the gasket [51].

1) If the gasket [51] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

(f) Install protective covers on the fuel tube [50], the fuel tube [57], and fuel pump package [1].

(g) Remove the nuts [52] that hold the bracket [53] and the servo fuel heater to the fuel pump package [1].

1) Remove the bracket [53].

(h) Install the nuts [52] to hold the servo fuel heater to the fuel pump package [1].

1) Tighten the nuts [52] to 98.0-110 pound-inches (11.0-12.5 Newton-meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH TWO DRAIN TUBES

SUBTASK 73-11-01-020-019-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(11) Do these steps to remove the drain tube [74] from the fuel pump package [1]:

(a) Use two wrenches to disconnect the drain tube [74] from the main oil/fuel heat exchanger.

(b) Use two wrenches to disconnect the drain tube [74] from the drain tube [70].

(c) Remove the nut [71], bolt [72], and clamp [73] that hold the drain tube [74] to the fuel pump package [1].

(d) Remove the drain tube [74].

1) Install protective covers on the drain tube [74] and fuel pump package [1].

(e) Use two wrenches to disconnect the drain tube [70] from the drain tube [66].

(f) Remove the drain tube [70].

1) Install protective covers on the drain tube [66], the drain tube [70], and fuel pump package [1].

IDC ALL; AIRPLANES WITH ONE DRAIN TUBE

SUBTASK 73-11-01-020-025-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(12) Do these steps to remove the drain tube [87] from the fuel pump package [1]:

(a) Use two wrenches to disconnect the drain tube [87] from the main oil/fuel heat exchanger.

(b) Use two wrenches to disconnect the drain tube [87] from the drain tube [66].

(c) Remove the nut [71], bolt [72], and clamp [73] that hold the drain tube [87] to the fuel pump package [1].

(d) Remove the drain tube [87].

1) Install protective covers on the drain tube [87], the drain tube [66], and fuel pump package [1].

IDC ALL

SUBTASK 73-11-01-020-020-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(13) Do these steps to remove the fuel tube [75] from the fuel pump package [1]:

(a) Use two wrenches to disconnect the fuel tube [75] from the hose [69].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the nut [78], bolt [79], and clamp [80] that hold the fuel tube [75] to the bottom of the fuel pump package [1].

(c) Remove the four bolts [77] that hold the fuel tube [75] and the gasket [76] to the fuel pump package [1].

(d) Remove the fuel tube [75].

1) If the gasket [76] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

2) Install protective covers on the fuel tube [75], the hose [69], and fuel pump package [1].

SUBTASK 73-11-01-020-008-F00

(14) Do these steps to disconnect the fuel supply hose [60] from the fuel pump inlet tube [63]:

(a) Remove the four bolts [62] to disconnect the fuel pump inlet tube [63] and the gasket [61] from the fuel supply hose [60].

(b) Move the fuel supply hose [60] away from the fuel pump inlet tube [63].

NOTE: If the fuel supply hose [60] is hard to move, then remove the bolts and clamps that hold the fuel supply hose [60] to the fan case.

1) If the gasket [61] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

2) Install the protective covers on the fuel supply hose [60] and the fuel pump inlet tube [63].

SUBTASK 73-11-01-020-021-F00



CAUTION

USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(15) Remove the drain tube [68]:

(a) Use two wrenches to disconnect the drain tube [68] from the bottom of the HMU.

(b) Use two wrenches to disconnect the drain tube [68] from the drain tube [67].

1) Remove the drain tube [68].

2) Install the protective covers on the drain tube [68], the drain tube [67] and the HMU.

SUBTASK 73-11-01-410-003-F00

(16) Do these steps to remove the fuel pump package [1]:

(a) Make sure that the protective covers are installed on all of the openings in the fuel pump package [1].

(b) Do these steps to install the fuel pump support equipment:

1) Install the cradle, SPL-2336 below the fuel pump package [1].

2) Lift the cradle, SPL-2336 with a hoist until it seats tightly below the fuel pump.

a) If the cradle, SPL-2336 does not seat tightly below the fuel pump, move the handle on the fuel filter cover out of the way.

3) Adjust the sling to keep the clearance between the sling and the bottom of the main oil/fuel heat exchanger flange.

4) Connect the fuel pump to the cradle, SPL-2336 with the strap that comes with the tool.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Remove the QAD bolt [81].

1) Install it in the opposite position with the jacking block, SPL-2189.

a) Keep the ball seat washer [82] for the subsequent installation.

WARNING BE CAREFUL WHEN YOU REMOVE THE FUEL PUMP PACKAGE. THE FUEL PUMP PACKAGE WEIGHS APPROXIMATELY 106 POUNDS (48 KG). THE WEIGHT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION DO NOT LIFT THE FUEL PUMP BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT SUPPORT THE WEIGHT OF THE FUEL PUMP. IF THE DRIVE SHAFT SUPPORTS THE WEIGHT OF THE FUEL PUMP, IT CAN CAUSE DAMAGE TO THE FUEL PUMP SEALS.

CAUTION YOU MUST HOLD THE WEIGHT OF THE FUEL PUMP AS YOU LOOSEN THE QAD RING. IF YOU DO NOT CORRECTLY HOLD THE WEIGHT (ALL OF THE TIME) AS YOU LOOSEN THE QAD RING, THE QAD RING WILL NOT OPEN.

(d) Operate the hoist until it holds the weight of the fuel pump package [1].

(e) Do these steps to loosen the QAD ring (Figure 404).

1) Use a non-metallic hammer to hit the QAD ring [83] in the counterclockwise direction.

CAUTION DO NOT TIGHTEN THE QAD BOLT TO MORE THAN 300 POUND-INCHES (34 NEWTON METERS). IF YOU TIGHTEN THE QAD BOLT TOO MUCH, YOU CAN CAUSE DAMAGE TO THE QAD RING.

2) Tighten the QAD bolt [81] to 300 in-lb (34 N·m).

3) Use a non-metallic hammer to hit the QAD ring [83] in the counterclockwise direction.

4) Tighten the QAD bolt [81] to 300 in-lb (34 N·m).

5) Use a non-metallic hammer to hit the QAD ring [83] in the counterclockwise direction.

6) Continue to hit the QAD ring [83] and tighten the bolt [81] until the QAD ring moves to the open position.

(f) Carefully disengage the fuel pump package [1] drive shaft from the Accessory Gearbox (AGB).

(g) Remove the fuel pump package [1] from the engine.

1) Install covers on the AGB mounting face.

(h) Remove and discard the gasket [85] from the QAD ring.

(i) Remove and discard the O-ring [86] from the fuel pump drive shaft.

(j) Remove the fuel pump package [1] from the cradle, SPL-2336 and the hoist.

SUBTASK 73-11-01-020-024-F00

(17) Do these steps to remove the fuel pump inlet tube [63] from the fuel pump package [1].

(a) Remove the four bolts [65] that hold the fuel pump inlet tube [63] and the gasket [64] to the fuel pump package [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the fuel pump inlet tube [63] and gasket [64].

1) If the gasket [64] is serviceable, then keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

2) Install protective covers on the fuel pump inlet tube [63] and fuel pump package [1].

SUBTASK 73-11-01-020-011-F00

(18) Do these steps if the fuel pump is replaced:

NOTE: It is necessary to remove the LRU's from the fuel pump to install a replacement fuel pump.

(a) Do this task: HMU Removal, TASK 73-21-10-000-801-F00.

(b) Do this task: Servo Fuel Heater Removal, TASK 73-11-07-000-801-F00.

(c) Do this task: Main Oil/Fuel Heat Exchanger Removal, TASK 79-21-02-000-801-F00.

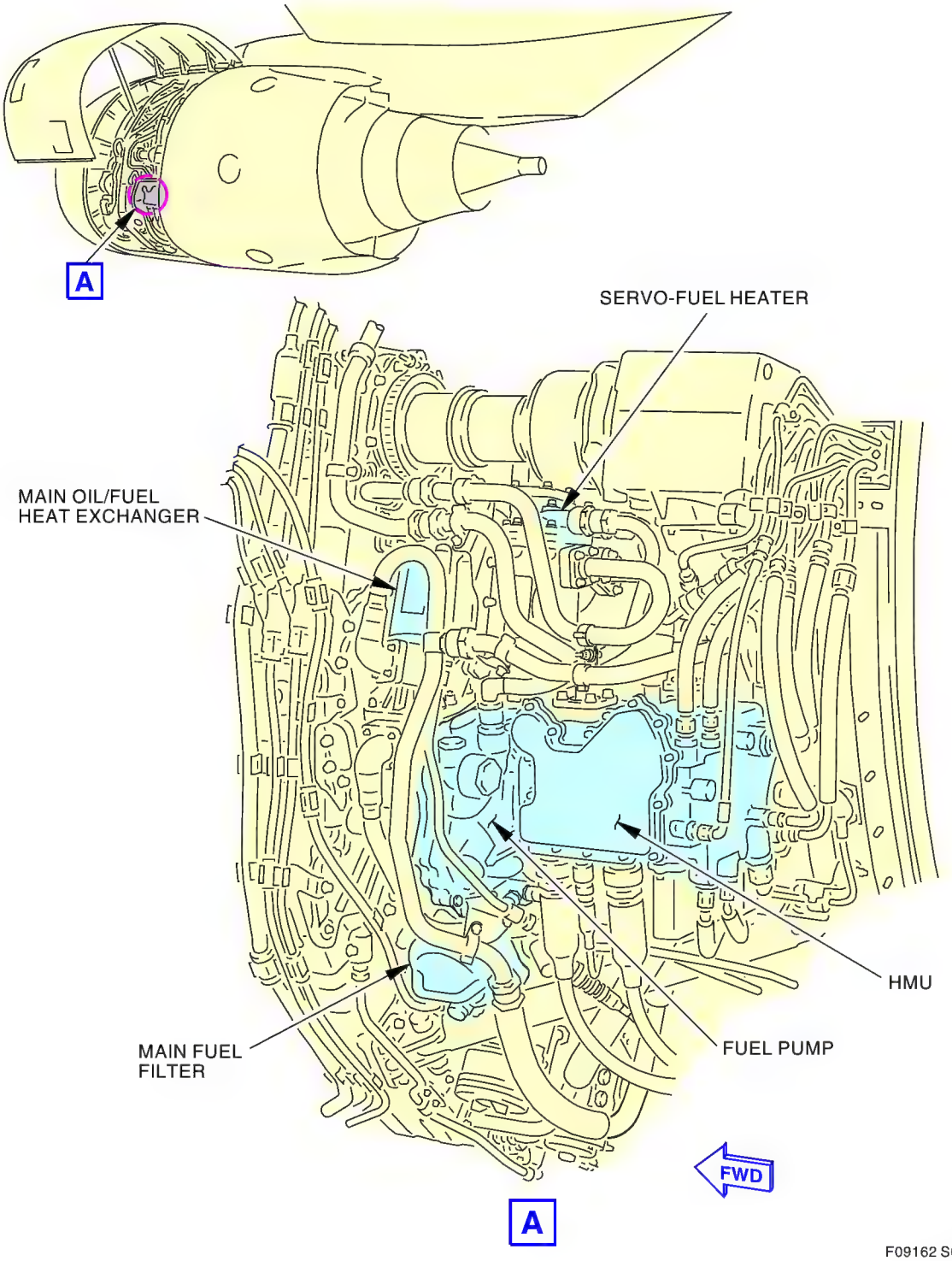
(d) Do this task: Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal, TASK 73-34-01-000-801-F00.

SUBTASK 73-11-01-620-002-F00

(19) If it is necessary to preserve the fuel pump, do this task: Fuel Pump Preservation, TASK 73-11-01-600-801-F00.

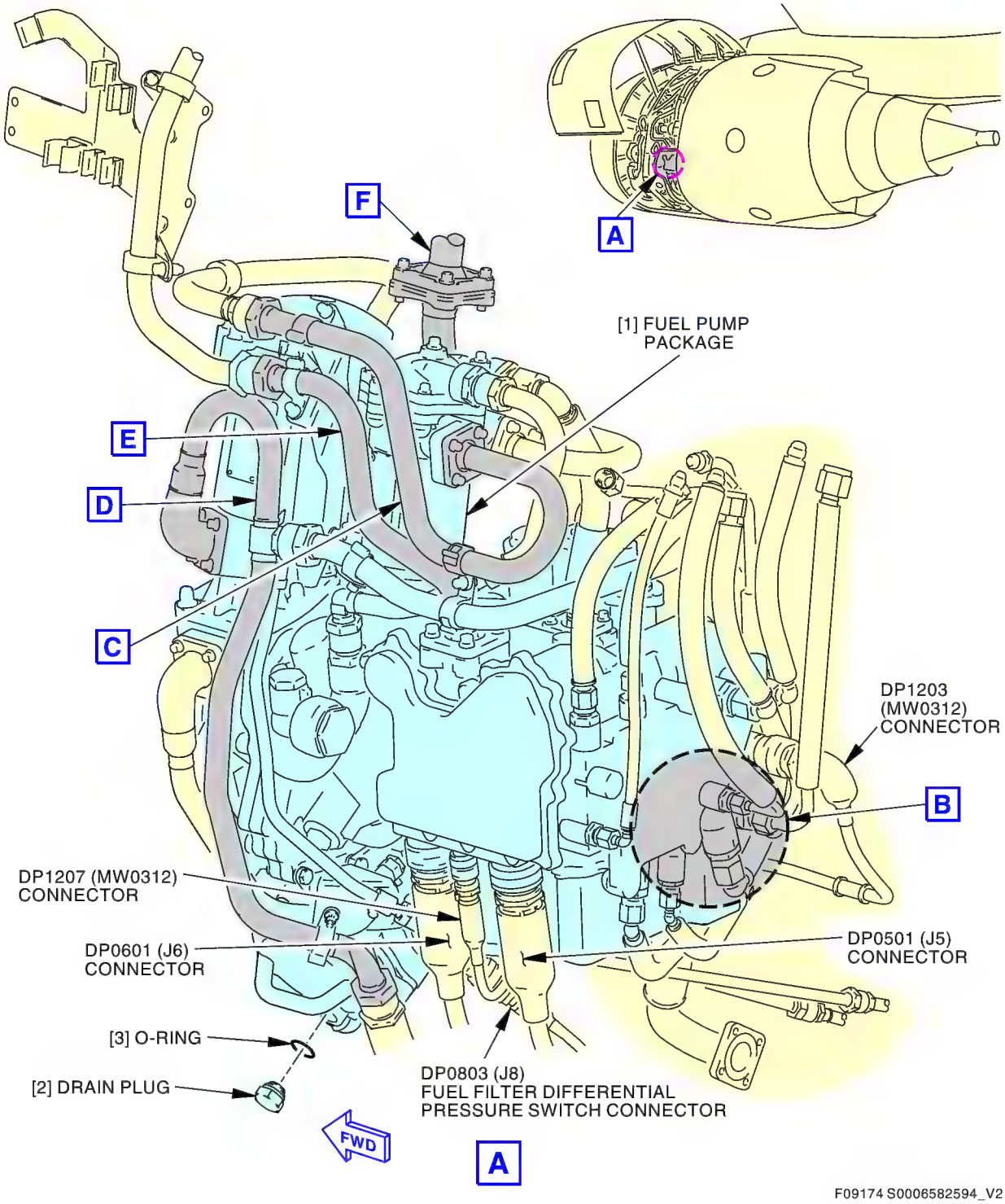
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



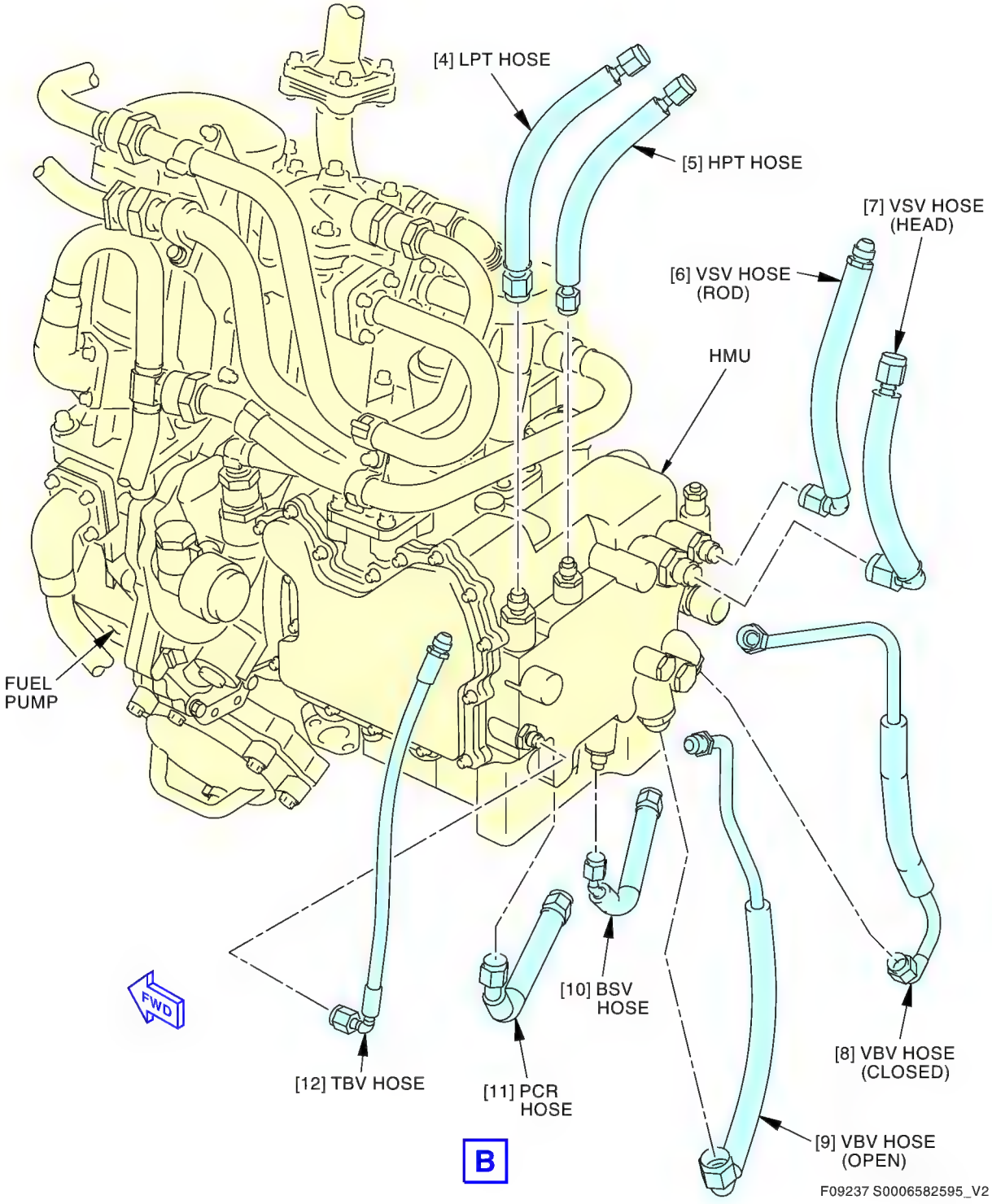
Fuel Pump Package Components
Figure 401/73-11-01-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



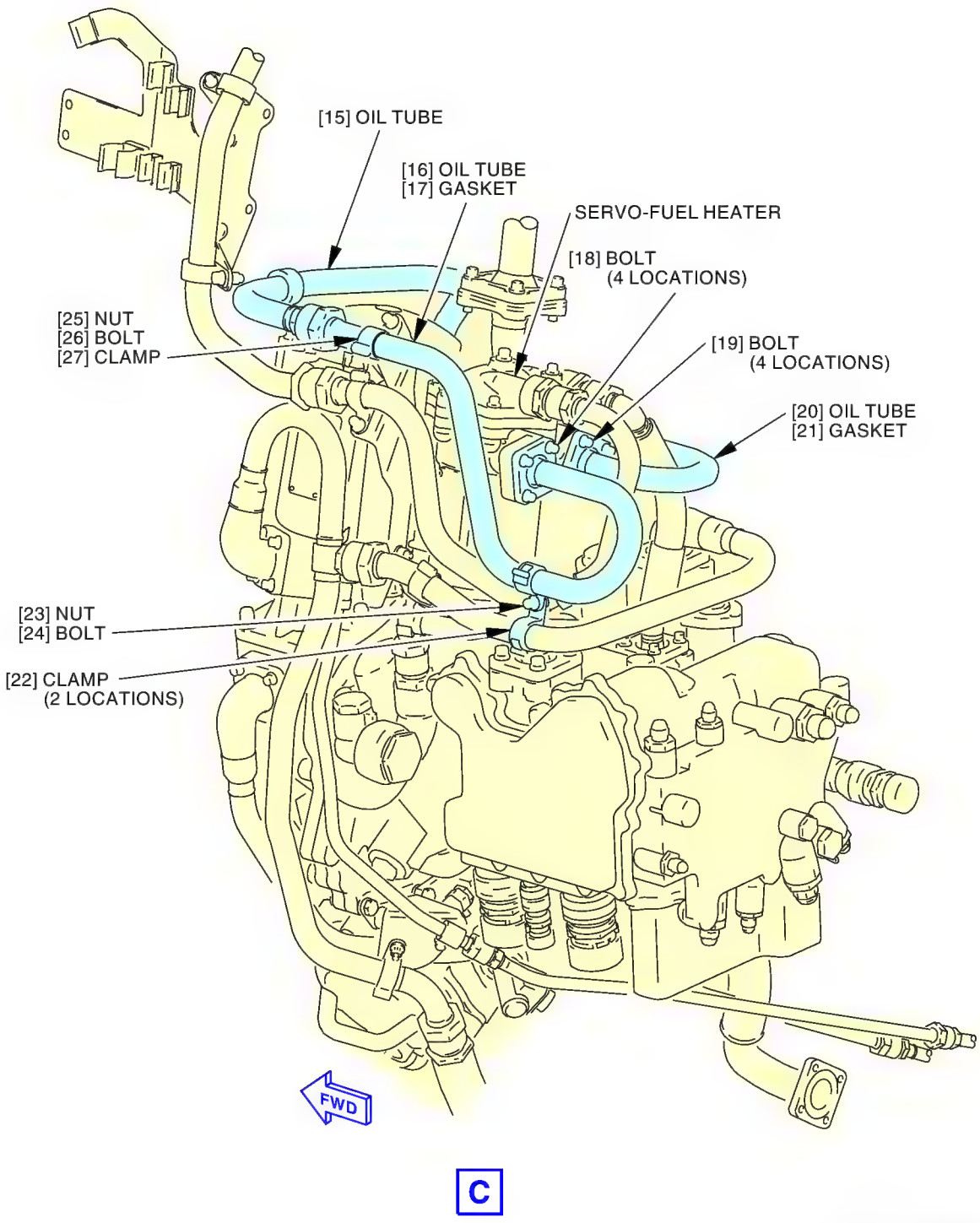
Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 1 of 7)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



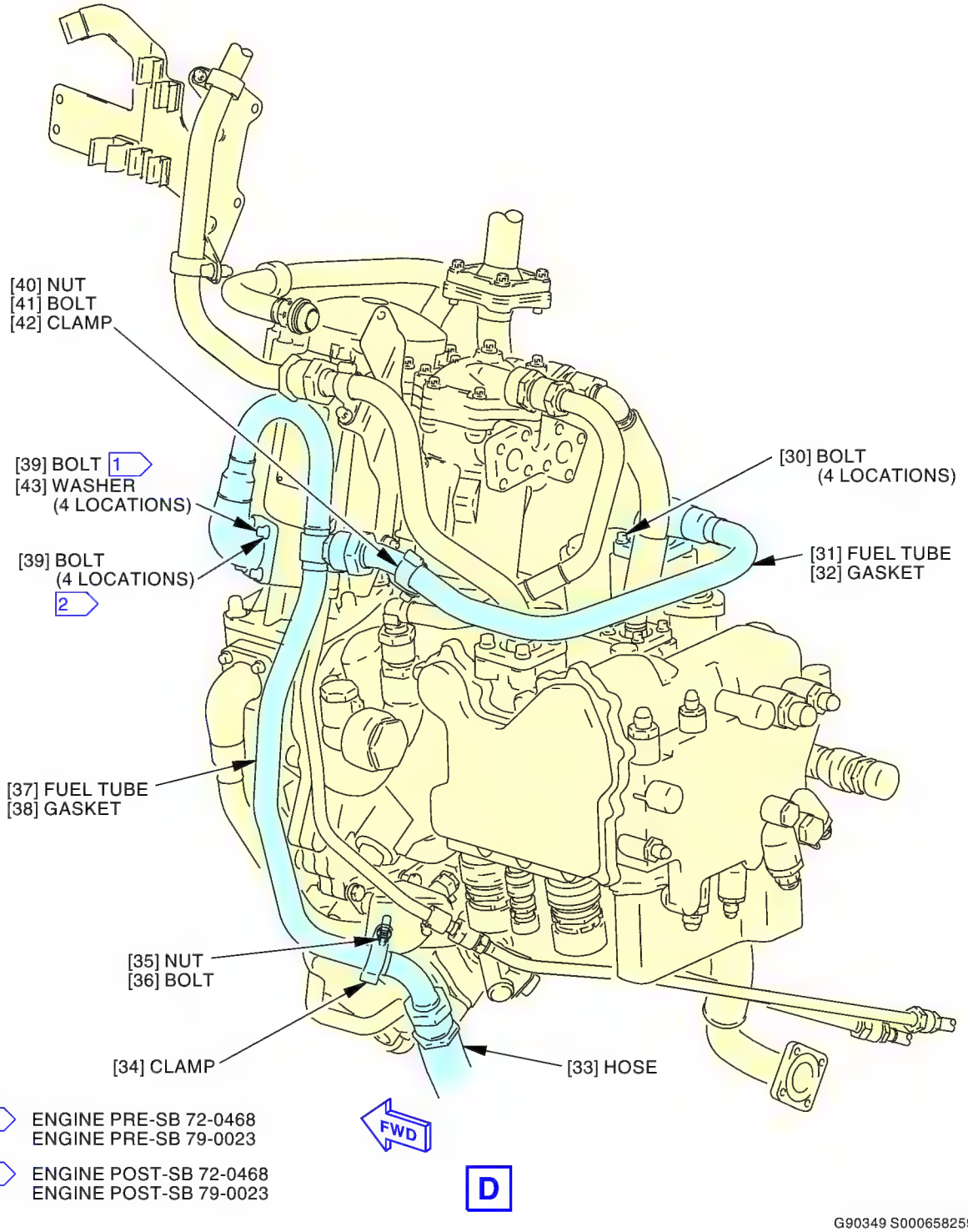
Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 2 of 7)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



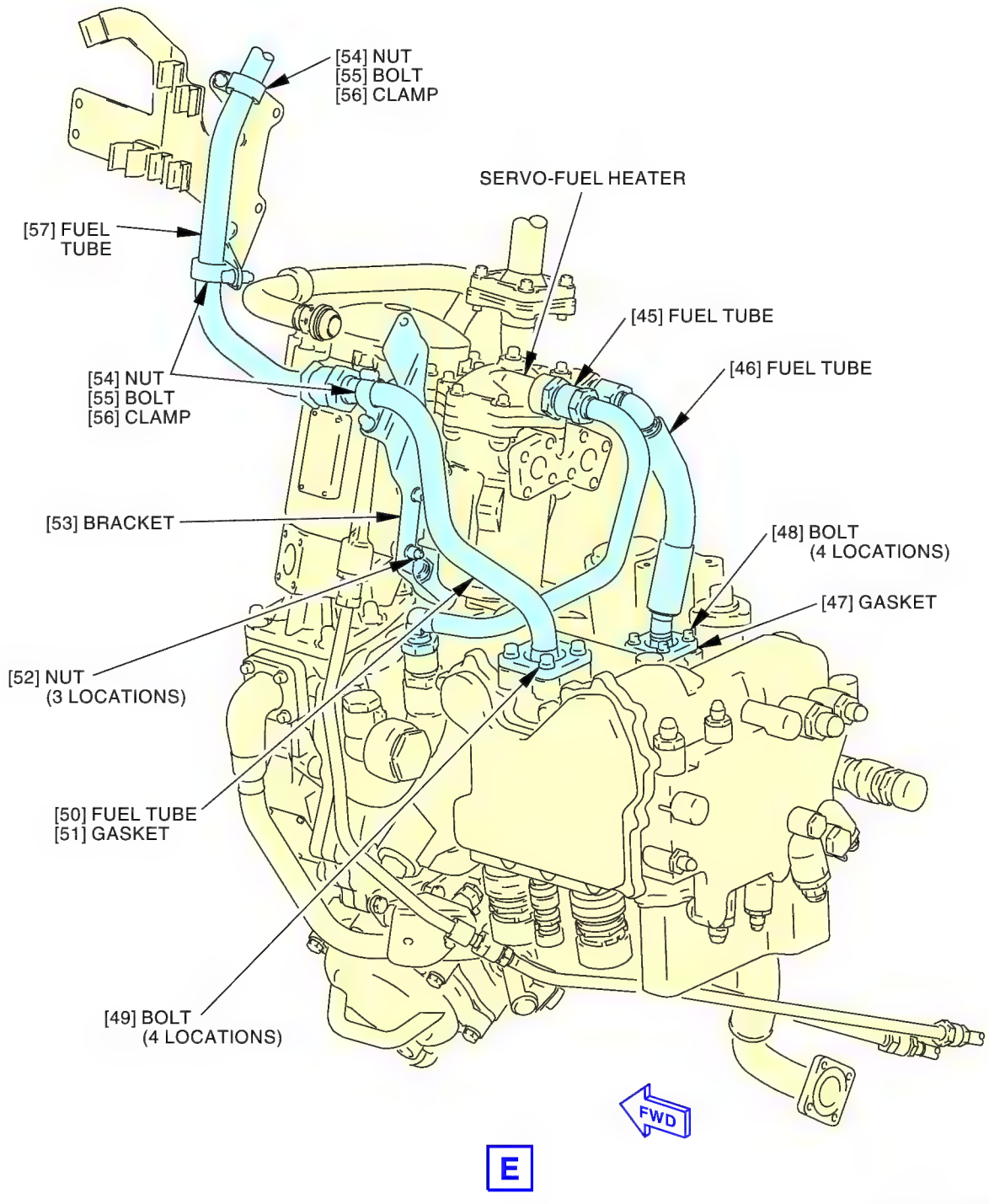
Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 3 of 7)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



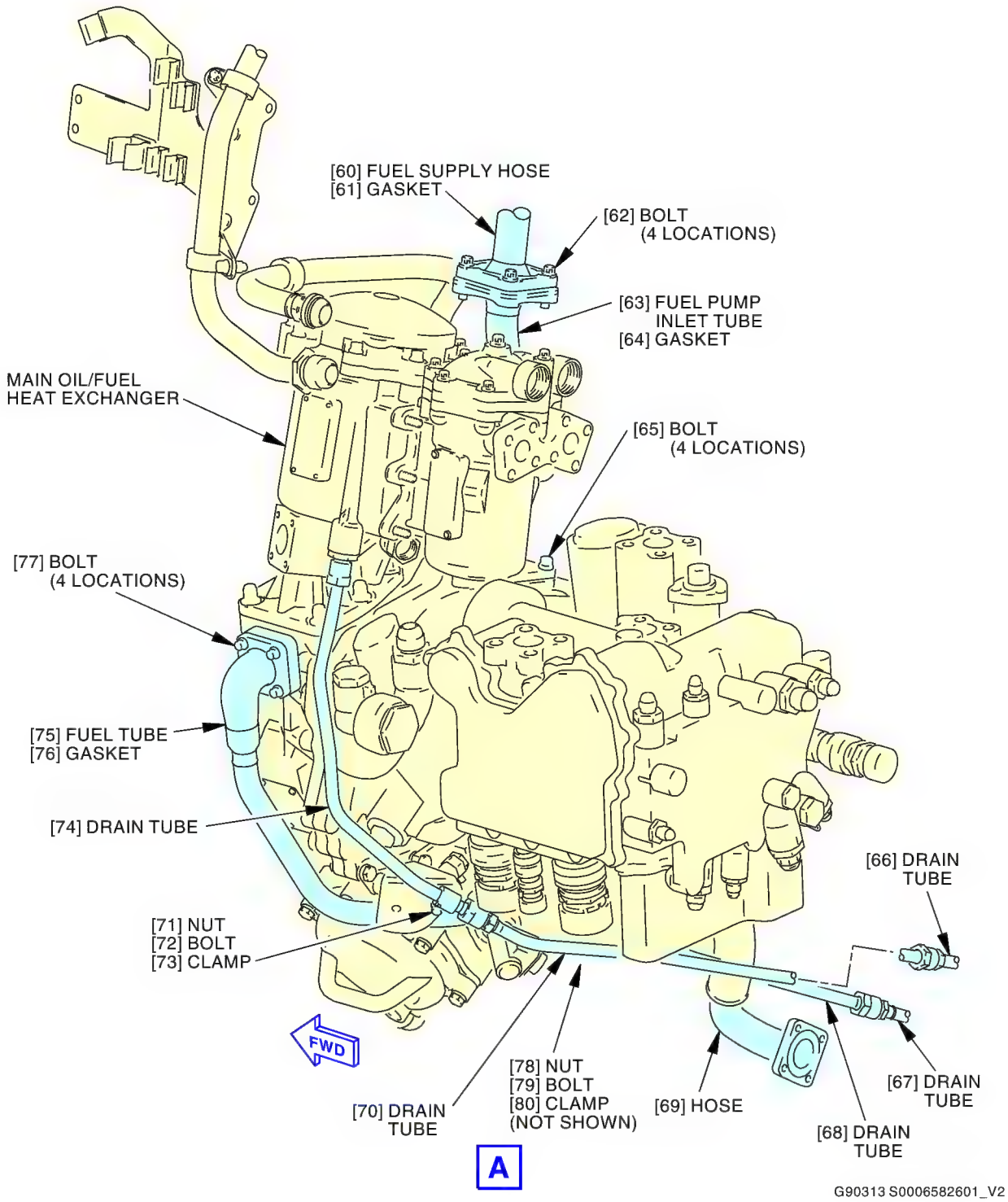
Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 4 of 7)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



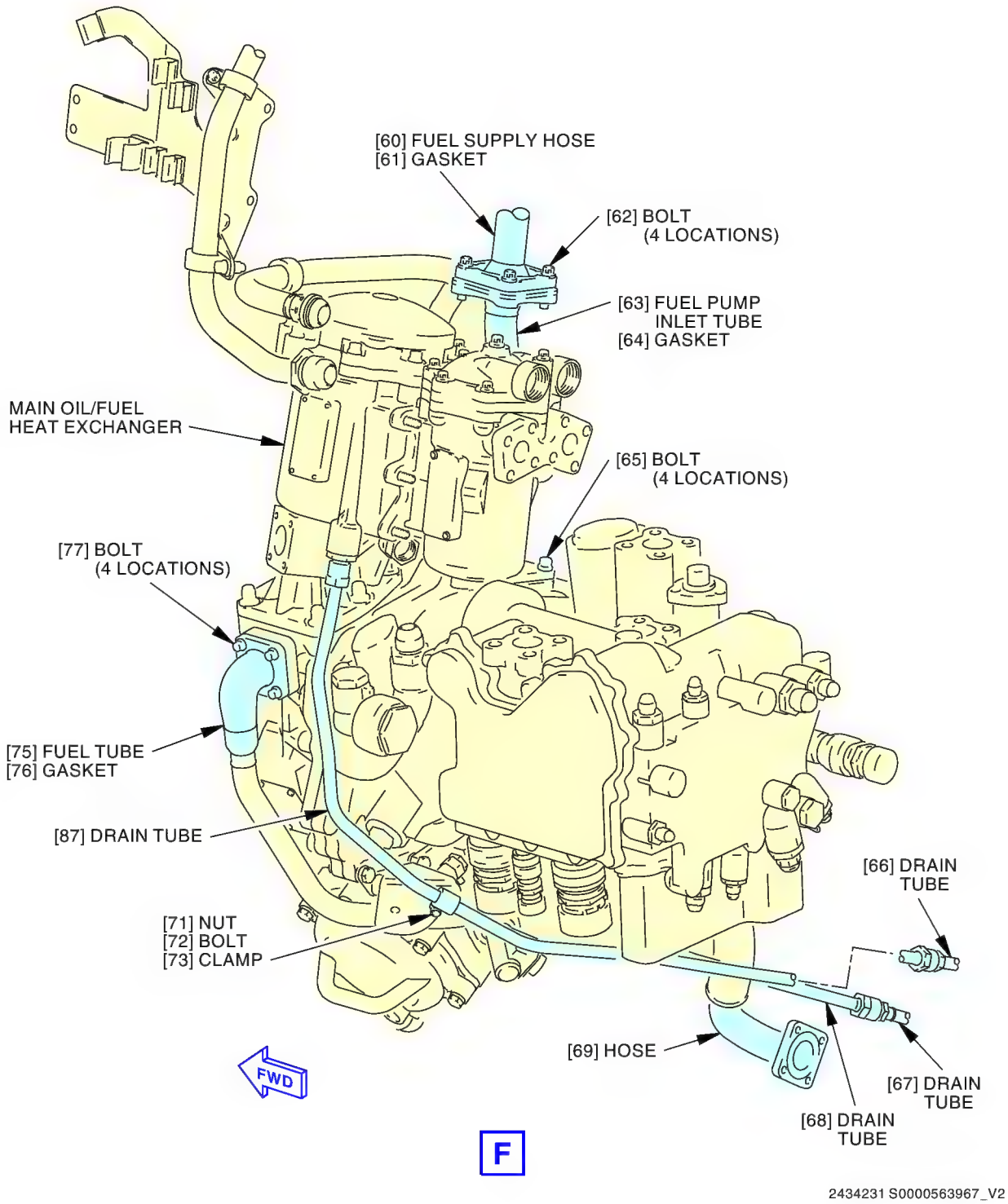
Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 5 of 7)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



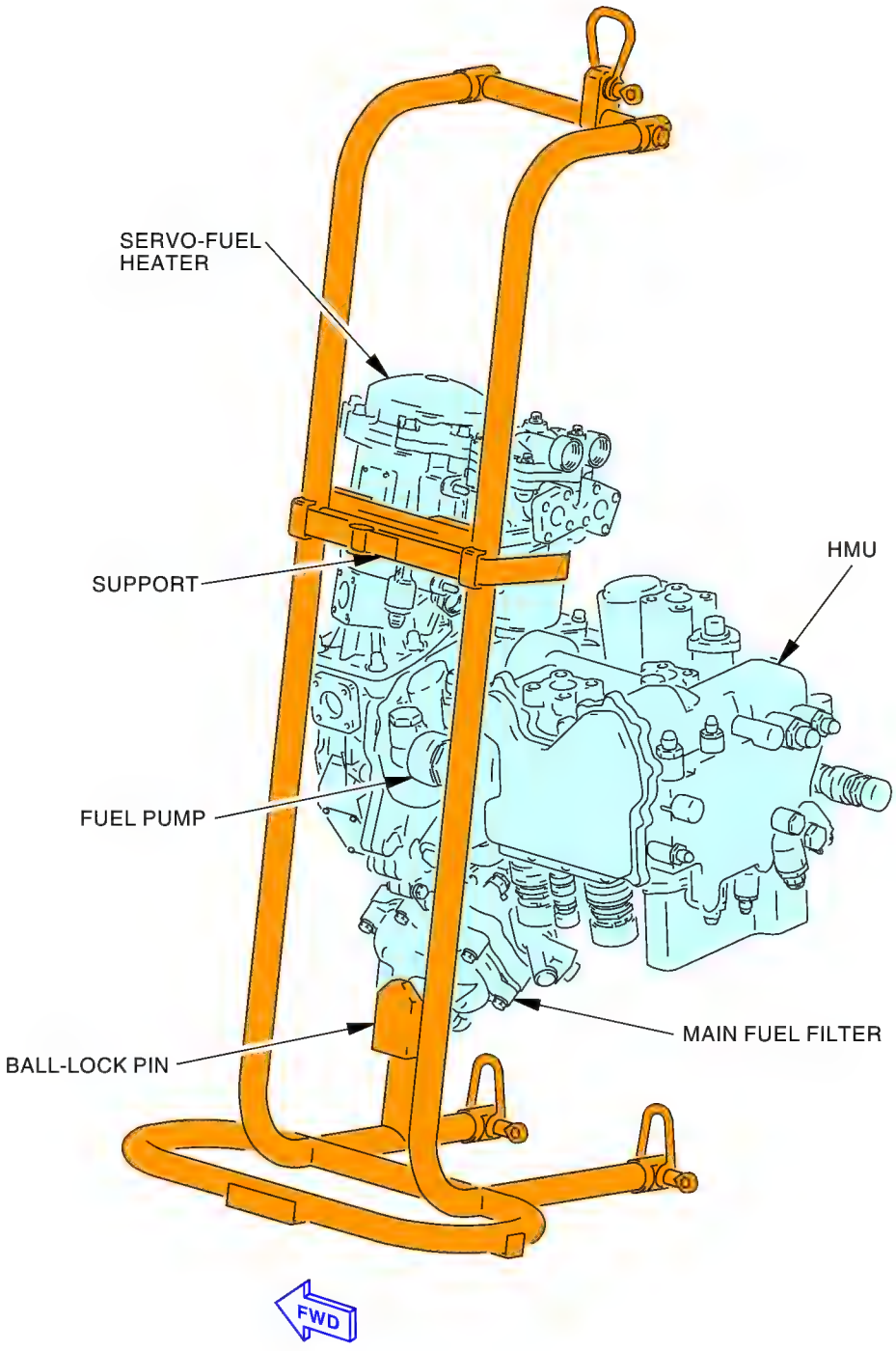
Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 6 of 7)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Pump Package Installation
Figure 402/73-11-01-990-804-F00 (Sheet 7 of 7)

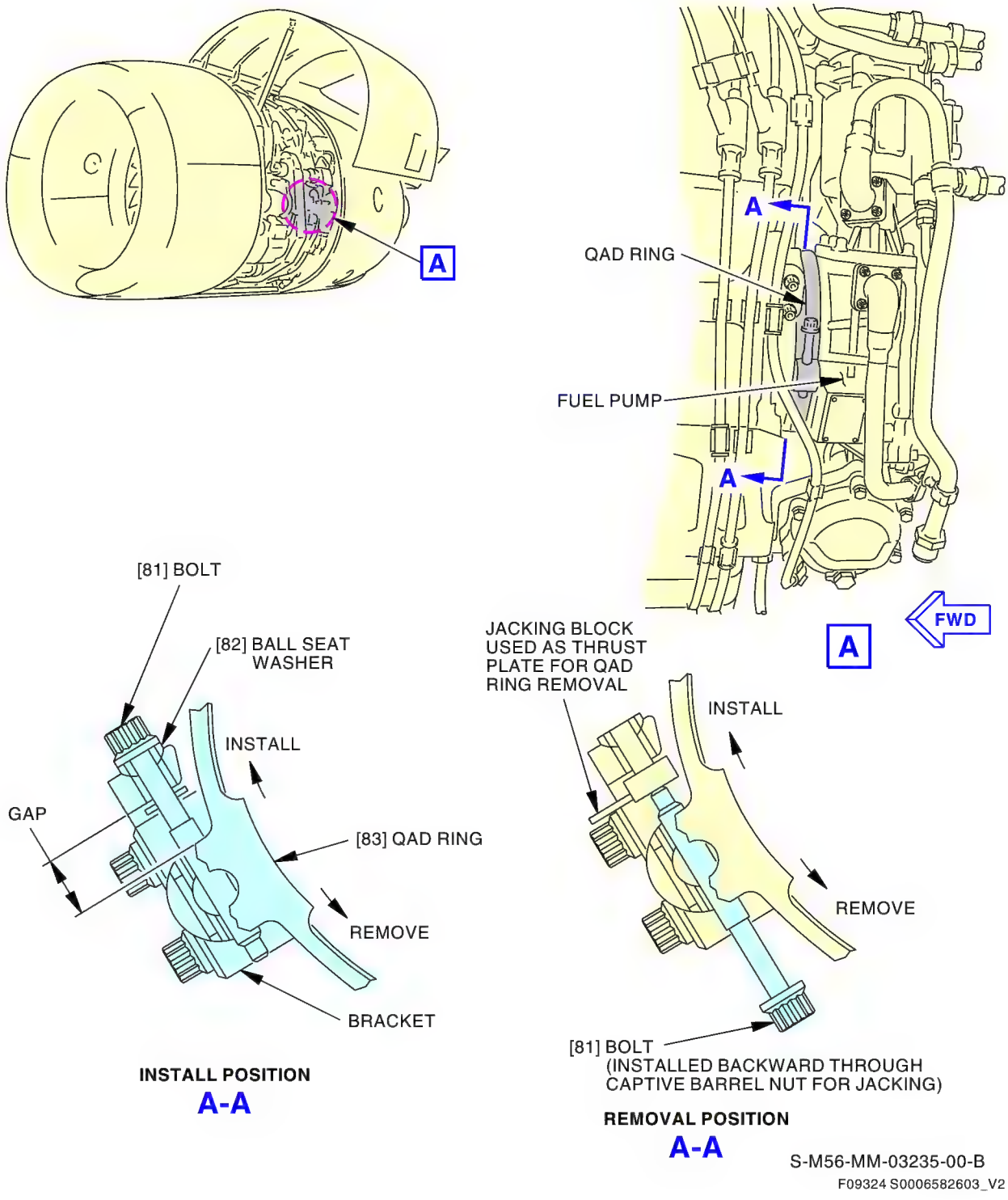
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



H27353 S0006582602_V2

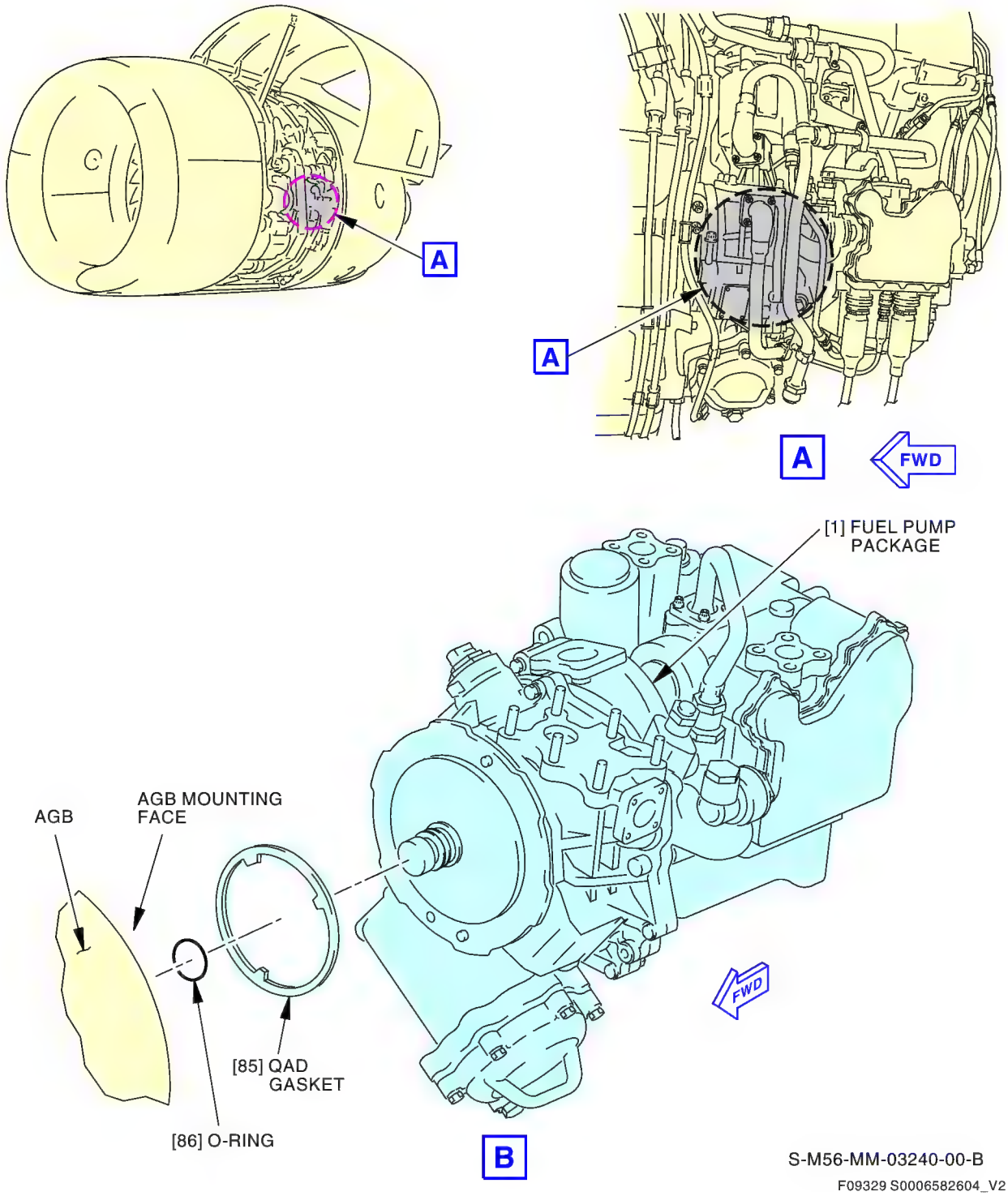
Fuel Pump Package Support Installation
Figure 403/73-11-01-990-805-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Pump QAD Ring Installation
Figure 404/73-11-01-990-806-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Pump Package Sealing Installation
Figure 405/73-11-01-990-807-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-01-400-801-F00

3. Fuel Pump Package Installation

(Figure 401, Figure 402, Figure 403, Figure 404 and Figure 405)

A. General

(1) This task provides the instructions on how to install the fuel pump package.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-20-02-400-801-F00	Tightening Practices and Torque Values (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
72-63-01-000-801-F00	Handcranking Drive Cover Removal (P/B 201)
72-63-01-400-801-F00	Handcranking Drive Cover Installation (P/B 201)
73-11-07-400-801-F00	Servo Fuel Heater Installation (P/B 401)
73-21-10-400-801-F00	HMU Installation (P/B 401)
73-34-01-400-801-F00	Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation (P/B 401)
79-21-02-400-801-F00	Main Oil/Fuel Heat Exchanger Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2336	Cradle - Support, Fuel Pump and MEC Part #: 856A3598G03 Supplier: 58828
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00599 [CP2442]	Oil - Engine	CFM CP2442
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel pump package	73-11-01-01-045	IDC 001-006
		73-11-01-01A-095	IDC 007-010, 012-999
2	Plug	73-11-01-01-060	IDC 001-006
		73-11-01-01A-110	IDC 007-010, 012-999
3	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999
17	Gasket	79-21-00-01-092	IDC 001-006
		79-21-00-01A-180	IDC 007-010, 012-999
21	Gasket	79-21-00-01-065	IDC 001-006
		79-21-00-01A-145	IDC 007-010, 012-999
32	Gasket	73-11-00-02-260	IDC 001-006
		73-11-00-02A-310	IDC 007-010, 012-999
38	Gasket	73-11-00-02-260	IDC 001-006
		73-11-00-02A-310	IDC 007-010, 012-999
47	Gasket	73-11-00-02-125	IDC 001-006
		73-11-00-02A-170	IDC 007-010, 012-999
51	Gasket	73-11-00-02-100	IDC 001-006
		73-11-00-02A-155	IDC 007-010, 012-999
61	Gasket	28-22-51-01A-020	IDC ALL
64	Gasket	73-11-00-02-270	IDC 001-006
		73-11-00-02A-325	IDC 007-010, 012-999
76	Gasket	73-11-00-02-260	IDC 001-006
		73-11-00-02A-310	IDC 007-010, 012-999
85	Gasket	73-11-01-01-038	IDC 001-006
		73-11-01-01A-080	IDC 007-010, 012-999
86	O-ring	73-11-01-01-036	IDC 001-006
		73-11-01-01A-075	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for Installation

SUBTASK 73-11-01-840-006-F00

(1) Do these steps to install the parts from the defective fuel pump:

(a) Remove the protective covers from the disconnected parts.

(b) Do these steps to examine the parts:

1) Clean the mating surfaces of the parts and the adjacent areas.

2) Examine the mating surfaces of the parts and the adjacent areas.

(c) Install the protective covers on the disconnected parts.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Examine the gaskets to make sure that they are serviceable (TASK 70-30-01-910-802-F00).

(d) Make sure that the drain plug [2] is correctly installed.

1) If it is not installed or is loose, install the drain plug [2].

a) Lubricate a new O-ring [3] with oil, D00623 [CP5066].

b) Install the new O-ring [3] on the drain plug [2].

c) Lubricate the threads of the drain plug [2] with oil, D00623 [CP5066].

d) Install the drain plug [2].

e) Tighten the drain plug [2] to 45.0 in-lb (5.1 N·m) - 55.0 in-lb (6.2 N·m).

f) Install the safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the drain plug [2].

SUBTASK 73-11-01-420-002-F00

(2) Do these steps to install a replacement pump:

NOTE: It is necessary to install the LRUs if the fuel pump is replaced.

(a) Do this task: HMU Installation, TASK 73-21-10-400-801-F00.

(b) Do this task: Main Oil/Fuel Heat Exchanger Installation, TASK 79-21-02-400-801-F00.

(c) Do this task: Servo Fuel Heater Installation, TASK 73-11-07-400-801-F00.

(d) Do this task: Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation, TASK 73-34-01-400-801-F00.

H. Fuel Pump Package Installation

SUBTASK 73-11-01-480-001-F00

(1) Do these steps to prepare for the installation of the fuel pump package [1].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(a) Lubricate a new O-ring [86] with vaseline, D00672 [CP5070].

(b) Install the new O-ring [86] in the groove of the fuel pump drive shaft.

(c) Lubricate a new QAD gasket [85] with vaseline, D00672 [CP5070].

(d) Install the new QAD gasket [85] on the fixed part of the QAD ring.

(e) Lubricate the threads of the QAD bolt [81] with oil, D00599 [CP2442].

WARNING BE CAREFUL WHEN YOU INSTALL THE FUEL PUMP. THE FUEL PUMP WEIGHS APPROXIMATELY 46.3 POUNDS (21 KG). THE WEIGHT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION DO NOT LIFT THE FUEL PUMP BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT SUPPORT THE WEIGHT OF THE FUEL PUMP. IF THE DRIVE SHAFT SUPPORTS THE WEIGHT OF THE FUEL PUMP, IT CAN CAUSE DAMAGE TO THE FUEL PUMP SEALS.

(f) Use the strap to install the fuel pump package on the cradle, SPL-2336.

(g) Attach the cradle, SPL-2336 to a suitable hoist.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(h) Move the cradle, SPL-2336 into its correct position below the fuel pump mounting pad.

(i) Operate the hoist to align the fuel pump package [1] with the face of the AGB.

SUBTASK 73-11-01-420-016-F00

(2) Do these steps to install the fuel pump inlet tube [63] on the fuel pump package [1].

(a) Lubricate these parts:

WARNING: DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [64] with vaseline, D00672 [CP5070].

2) Lubricate the threads of the bolts [65] with graphite mineral vaseline, D00601 [CP2101].

(b) Remove the protective covers from the bottom of the fuel pump inlet tube [63] and the applicable cover from the fuel pump package [1].

(c) Use the four bolts [65] to connect the fuel pump inlet tube [63] and the gasket [64] to the fuel pump package [1].

1) Tighten the bolts [65] to 98.0 in-lb (11.1 N·m) - 110.0 in-lb (12.4 N·m).

SUBTASK 73-11-01-420-005-F00

(3) Do these steps to install the fuel pump package [1]:

(a) If it is necessary, turn the Accessory Gearbox (AGB) output shaft to align with the fuel pump drive shaft (TASK 72-63-01-000-801-F00).

1) Turn the handcranking drive pad with a 3/4-inch square drive to align the fuel pump drive shaft splines with the AGB drive recess.

CAUTION: DO NOT LIFT THE FUEL PUMP BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT SUPPORT THE WEIGHT OF THE FUEL PUMP. IF THE DRIVE SHAFT SUPPORTS THE WEIGHT OF THE FUEL PUMP, IT CAN CAUSE DAMAGE TO THE FUEL PUMP SEALS.

(b) Engage the fuel pump package [1] in the AGB.

(c) Turn the QAD ring [83] clockwise until it engages with the fuel pump flange.

(d) Make sure that the ball seat washer [82] is correctly installed on the QAD ring [83].

(e) Install the QAD bolt [81] in the QAD ring [83].

CAUTION: DO NOT TIGHTEN THE QAD BOLT TO MORE THAN 320 IN-LB (36 N.M). IF YOU TIGHTEN THE QAD BOLT TOO MUCH, YOU CAN CAUSE DAMAGE TO THE QAD RING.

(f) Tighten the QAD bolt [81] to 310 in-lb (35 N·m) - 320 in-lb (36.2 N·m).

1) Lightly hit all around the outer surface of the QAD ring [83] with a non-metallic hammer or a rubber mallet.

(g) Tighten the QAD bolt [81] to 310 in-lb (35.0 N·m) - 320 in-lb (36.2 N·m).

NOTE: The final torque of the QAD bolt [81] of the QAD ring [83] will be done at the end of this procedure after the engine test.

(h) Remove the hoist and the cradle, SPL-2336 from the fuel pump package [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(i) Do this task: Handcranking Drive Cover Installation, TASK 72-63-01-400-801-F00.

SUBTASK 73-11-01-420-006-F00

(4) Do these steps to connect the fuel supply hose [60] to the fuel pump inlet tube [63] on the fuel pump package [1].

(a) Lubricate these parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [61] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [62] with Never-Seez NSBT compound, D00006.

(b) Remove the protective covers from the fuel supply hose [60] and the upper end of the fuel pump inlet tube [63].

(c) Put the fuel supply hose [60] and the gasket [61] in the correct position on the fuel pump inlet tube [63].

NOTE: If it is not easy to put the fuel supply hose into its position, remove the bolts and clamps that hold the fuel supply hose to the fan case.

(d) Use the four bolts [62] to connect the fuel supply hose [60] and the gasket [61] to the fuel pump inlet tube [63].

1) Tighten the bolts [62] to between 50 in-lb (5.6 N·m) and 55 in-lb (6.2 N·m).

(e) If the clamps were removed or loosened, install the clamps and the bolts to connect the fuel supply hose [60] to the fan case.

1) Tighten the bolts for the clamps to between 98.0 in-lb (11.1 N·m) and 110.0 in-lb (12.4 N·m).

SUBTASK 73-11-01-420-007-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(5) Do these steps to install the fuel tube [75] on the fuel pump package [1]:

(a) Remove the protective covers from the hose [69], the fuel tube [75], and the applicable cover from the fuel pump package [1].

(b) Lubricate these parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [76] with vaseline, D00672 [CP5070].

2) Lubricate the threads of the bolts [77] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the fuel tube [75] and the gasket [76] in the correct position between the fuel pump package [1] and hose [69].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(d) Install and hand tighten the four bolts [77] that hold the fuel tube [75] and gasket [76] to the fuel pump package [1].

(e) Connect and hand tighten the fuel tube [75] to the hose [69].

(f) Use the nut [78], bolt [79], and clamp [80] to connect the fuel tube [75] to the bottom of the fuel pump package [1].

(g) Make sure that the fuel tube [75] does not touch other parts of the engine.

(h) Tighten the bolts [77] to between 49 in-lb (5.5 N·m) and 53 in-lb (6.0 N·m).

(i) Use two wrenches to tighten the coupling nut between fuel tube [75] and hose [69] to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

(j) Tighten the nut [78] to between 72 in-lb (8.1 N·m) and 88 in-lb (9.9 N·m).

SUBTASK 73-11-01-020-022-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(6) Install the drain tube [68] to the bottom of the HMU:

(a) Remove the protective covers from the drain tube and the HMU.

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(b) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the drain tube [68] in the correct position between the HMU and the drain tube [67].

(d) Connect and hand tighten the drain tube [68] to the bottom of the HMU.

(e) Connect and hand tighten the drain tube [68] to the drain tube [67].

1) Make sure that the drain tube [68] does not touch other components.

(f) Use two wrenches to tighten the coupling nuts to between 257 in-lb (29 N·m) and 284 in-lb (32 N·m).

IDC ALL; AIRPLANES WITH TWO DRAIN TUBES

SUBTASK 73-11-01-420-008-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(7) Do these steps to install the drain tube [70] and drain tube [74] on the fuel pump package [1]:

(a) Remove the protective covers from the drain tube [74], the drain tube [70], the drain tube [66], and the applicable cover from the fuel pump package [1].

(b) Lubricate these parts:

1) Lubricate the threads of the bolt [72] with graphite mineral vaseline, D00601 [CP2101].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH TWO DRAIN TUBES (Continued)

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

2) Lubricate the threads of the nipples with oil, D00623 [CP5066].

(c) Connect and hand tighten the drain tube [70] to the drain tube [66].

(d) Put the drain tube [74] in its correct position between the fuel pump package [1] and drain tube [70].

(e) Connect and hand tighten the drain tube [74] to the fuel pump package [1] and to the drain tube [70].

(f) Install and hand tighten the nut [71], bolt [72], and clamp [73] that hold the drain tube [74] to the bracket.

(g) Make sure that the drain tube [70] and drain tube [74] do not touch other components.

(h) Use two wrenches to tighten the coupling nut, between the drain tube [70] and the drain tube [66], to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(i) Use two wrenches to tighten the coupling nut, between the drain tube [74] and the drain tube [70], to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(j) Use two wrenches to tighten the coupling nut, between the drain tube [74] and the fuel pump package [1] to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(k) Tighten the nut [71] for the clamp [73] to between 50.0 in-lb (5.6 N·m) and 80.0 in-lb (9.0 N·m).

IDC ALL; AIRPLANES WITH ONE DRAIN TUBE

SUBTASK 73-11-01-420-018-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(8) Do these steps to install the drain tube [87] on the fuel pump package [1]:

(a) Remove the protective covers from the drain tube [87], the drain tube [66], and the applicable cover from the fuel pump package [1].

(b) Lubricate these parts:

1) Lubricate the threads of the bolt [72] with graphite mineral vaseline, D00601 [CP2101].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

2) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the drain tube [87] in its correct position between the fuel pump package [1] and drain tube [66].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH ONE DRAIN TUBE (Continued)

(d) Connect and hand tighten the drain tube [87] to the fuel pump package [1] and to the drain tube [66].

(e) Install and hand tighten the nut [71], bolt [72], and clamp [73] that hold the drain tube [87] to the bracket.

(f) Make sure that the drain tube [87] do not touch other components.

(g) Use two wrenches to tighten the coupling nut, between the drain tube [87] and the drain tube [66], to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(h) Use two wrenches to tighten the coupling nut, between the drain tube [87] and the fuel pump package [1] to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(i) Tighten the nut [71] for the clamp [73] to between 50.0 in-lb (5.6 N·m) and 80.0 in-lb (9.0 N·m).

IDC ALL

SUBTASK 73-11-01-420-009-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(9) Do these steps to install the bracket [53] and fuel tube [50]:

(a) Remove the three nuts [52] that hold the servo fuel heater to the fuel pump package [1].

(b) Lubricate the threads of the studs for the bracket [53] with graphite mineral vaseline, D00601 [CP2101].

(c) Put the bracket [53] in its correct position on the servo fuel heater and the fuel pump package [1].

1) Use the nuts [52] to connect the bracket [53] to the servo fuel heater and the fuel pump package [1].

a) Tighten the nuts [52] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

(d) Remove the protective covers from the fuel tube [50], the fuel tube [57], and the applicable cover from the fuel pump package [1].

(e) Lubricate these parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [51] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [49] and bolts [55] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CAUTION

LOOK AT THE GASKET BEFORE YOU INSTALL IT. OBEY THE INSTRUCTIONS IN SEALS (PREFORMED PACKINGS AND O-RINGS) AND GASKETS, TASK 70-30-01-910-802-F00. DO NOT CAUSE DAMAGE TO THE RUBBER SEAL WHEN YOU INSTALL THE GASKET.

(f) Put the fuel tube [50] and gasket [51] in its correct position between the fuel tube [57] and the fuel pump package [1].

(g) Install and hand tighten the four bolts [49] that hold the fuel tube [50] and gasket [51] to the fuel pump package [1].

(h) Connect and hand tighten the fuel tube [50] to the fuel tube [57].

(i) Make sure that the fuel tube [50] is in its correct position.

(j) Install and hand tighten the nut [54], bolt [55], and clamp [56] that hold the fuel tube [50] to the bracket [53].

(k) Install and hand tighten the nuts [54], bolts [55], and clamps [56] that hold the fuel tube [57] to the bracket above the fuel pump package [1].

CAUTION

TIGHTEN THE BOLTS CORRECTLY. REFER TO TIGHTENING PRACTICES AND TORQUE VALUES, TASK 70-20-02-400-801-F00. IF YOU TIGHTEN THEM INCORRECTLY, DAMAGE TO THE PARTS CAN OCCUR.

(l) Tighten the four bolts [49] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

(m) Use two wrenches to tighten the coupling nut between fuel tube [50] and fuel tube [57] to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

(n) Tighten the three nuts [54] for the clamps [56] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

SUBTASK 73-11-01-420-010-F00

CAUTION

USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(10) Do these steps to install the fuel tube [45] on the fuel pump package [1]:

(a) Remove the protective covers from the fuel tube [45] and the applicable covers from the servo fuel heater and fuel pump.

WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(b) Lubricate the threads of the nipples with oil, D00623 [CP5066].

(c) Put the fuel tube [45] in its correct position between the fuel pump and the servo fuel heater.

(d) Connect and hand tighten the fuel tube [45] to the servo fuel heater and the fuel pump.

1) Make sure that the fuel tube [45] does not touch other components.

(e) Use two wrenches to tighten the coupling nut between fuel tube [45] and the fuel pump to 650 in-lb (73.4 N·m) - 770 in-lb (87.0 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) Use two wrenches to tighten the coupling nut between fuel tube [45] and the servo fuel heater to 650 in-lb (73.4 N·m) - 770 in-lb (87.0 N·m).

SUBTASK 73-11-01-420-011-F00

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(11) Do these steps to install the fuel tube [46] on the fuel pump package [1]:

(a) Remove the protective covers from the fuel tube [46] and the applicable covers from the servo fuel heater and the HMU.

(b) Lubricate these parts:

WARNING: DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [47] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [48] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the fuel tube [46] and the gasket [47] in the correct position between the HMU and the servo fuel heater.

(d) Connect and hand tighten the fuel tube [46] to the servo fuel heater.

(e) Install and hand tighten the four bolts [48] that hold the fuel tube [46] and the gasket [47] to the HMU.

1) Tighten the bolts [48] to between 49.0 in-lb (5.5 N·m) and 53.0 in-lb (6.0 N·m).

(f) Use two wrenches to tighten the coupling nut between fuel tube [46] and the servo fuel heater to 650 in-lb (73.4 N·m) - 770 in-lb (87.0 N·m).

SUBTASK 73-11-01-420-012-F00

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(12) Do these steps to install the fuel tube [31] and the fuel tube [37] on the fuel pump package [1]:

(a) Remove the protective covers from the gasket [32], fuel tube [37], hose [33], and the applicable cover from the fuel pump package [1].

(b) Lubricate these parts:

WARNING: DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [32] and gasket [38] with oil, D00623 [CP5066].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Lubricate the threads of the bolt [30], bolt [36], bolt [39], and bolt [41] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipples with oil, D00623 [CP5066].

(c) Put the fuel tube [37] and the gasket [38] in the correct position between the fuel pump and the hose [33].

IDC ALL PRE CFM56-7B-79-0023 OR PRE CFM56-7B-72-0468

(d) Install and hand tighten the four bolts [39] that hold the fuel tube [37], the gasket [38], and the four washers [43] to the fuel pump package [1].

IDC ALL POST CFM56-7B-79-0023 AND POST CFM56-7B-72-0468

(e) Install and hand tighten the four bolts [39] that hold the fuel tube [37] and the gasket [38] to the fuel pump package [1].

IDC ALL

(f) Connect and hand tighten the fuel tube [37] to the hose [33].

(g) Install and hand tighten the nut [35], bolt [36], and the clamp [34] that hold the fuel tube [37] to the bracket.

(h) Put the fuel tube [31] and the gasket [32] in the correct position between the fuel pump and the fuel tube [37].

(i) Install and hand tighten the four bolts [30] that hold the fuel tube [31] and the gasket [32] to the fuel pump package [1].

(j) Connect and hand tighten the fuel tube [31] to the fuel tube [37].

1) Install and hand tighten the nut [40], bolt [41], and clamp [42] that hold the fuel tube [31] to the bracket [53].

(k) Make sure that the fuel tube [31] and fuel tube [37] are in their correct positions and do not touch other components.

(l) Tighten the bolts [30] (that hold the fuel tube [31] to the fuel pump) between 49.0 in-lb (5.5 N·m) and 53.0 in-lb (6.0 N·m).

IDC ALL PRE CFM56-7B-79-0023 OR PRE CFM56-7B-72-0468

(m) Tighten the bolts [39] (that hold the fuel tube [37] to the fuel pump package [1]) between 49 in-lb (5.5 N·m) and 53 in-lb (6.0 N·m).

IDC ALL POST CFM56-7B-79-0023 AND POST CFM56-7B-72-0468

(n) Tighten the bolts [39] (that hold the fuel tube [37] to the fuel pump package [1]) as follows:

1) Follow these steps to cross-tighten the four bolts [39].

a) Start with the first bolt at the top left side of the port.

b) Tighten the second bolt that is at the diagonal opposite location of the first bolt.

c) Tighten the third bolt that is at the bottom left side of the port.

d) Tighten the fourth bolt that is at the diagonal opposite location of the third bolt.

2) Tighten the bolts [39] between 40.0 in-lb (4.52 N·m) and 45.0 in-lb (5.08 N·m).

3) Loosen the bolts [39] but do not remove them.

4) Measure the locking torque of each bolt [39].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST CFM56-7B-79-0023 AND POST CFM56-7B-72-0468 (Continued)

a) The torque value must be between 2.2 in-lb (0.25 N·m) and 15.0 in-lb (1.69 N·m).

b) If not, replace the bolt [39].

5) The torque value must be between 2.2 in-lb (0.25 N·m) and 15.0 in-lb (1.69 N·m).

6) Add the locking torque value of bolts [39] recorded before.

7) Tighten the bolts [39] to a final torque of 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

IDC ALL

(o) Make sure that the fuel tube [31] and fuel tube [37] stay in their correct positions as the coupling nuts are tightened.

1) Use two wrenches to tighten the coupling nut, between fuel tube [37] and the hose [33], to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

2) Use two wrenches to tighten the coupling nut, between the fuel tube [31] and fuel tube [37] to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

(p) Tighten the nut [35] and nut [40] that hold the clamp [34] and clamp [42] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

SUBTASK 73-11-01-420-013-F00

(13) Do these steps to connect the oil tube [20] on the fuel pump package [1]:

(a) Remove the protective cover from the oil tube [20] and the applicable cover from the servo fuel heater.

(b) Lubricate these parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [21] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [19] with graphite mineral vaseline, D00601 [CP2101].

(c) Put the oil tube [20] and the gasket [21] in their correct positions on the servo fuel heater.

(d) Install and hand tighten the four bolts [19] that hold the oil tube [20] and the gasket [21] to the servo fuel heater.

1) Tighten the bolts [19] to between 49.0 in-lb (5.5 N·m) and 53.0 in-lb (6.0 N·m).

SUBTASK 73-11-01-420-014-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(14) Do these steps to install the oil tube [16] on the fuel pump package [1]:

(a) Remove the protective covers from the oil tube [16], the oil tube [15], and the applicable cover from the servo fuel heater.

(b) Lubricate these parts:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [17] with oil, D00623 [CP5066].
2) Lubricate the threads of the bolt [18], bolt [24], and bolt [26] with graphite mineral vaseline, D00601 [CP2101].
3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the oil tube [16] and the gasket [17] in the correct position between the servo fuel heater and the oil tube [15].

(d) Install and hand tighten the four bolts [18] that hold the oil tube [16] and the gasket [17] to the servo fuel heater.

(e) Connect and hand tighten the coupling nut between the oil tube [15] and oil tube [16].

CAUTION MAKE SURE THAT THE CLAMPS DO NOT INTERFERE WITH THE HMU, THE FUEL TUBES OR THE OIL TUBES. IF INTERFERENCE OCCURS, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(f) Install and hand tighten the nut [23], bolt [24] and the clamps [22] that hold the tubes at the top of the HMU.

(g) Install and hand tighten the nut [25], bolt [26] and the clamp [27] that hold the oil tube [16] to the bracket [53].

(h) Tighten the bolts [18] to between 49 in-lb (5.5 N·m) and 53 in-lb (6.0 N·m).

(i) Make sure that the oil tube [16] stays in the correct position as the coupling nut is tightened.

1) Use two wrenches to tighten the coupling nut between oil tube [15] and oil tube [16] to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

(j) Tighten the nut [23] for the clamps [22] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

(k) Tighten the nut [25] for the clamp [27] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

SUBTASK 73-11-01-420-015-F00

CAUTION USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(15) Connect these hoses to the HMU:

NOTE: The hose installations are arranged so that same wrenches and torque values are used at the same time.

(a) Remove the protective covers from the hoses and the HMU.

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(b) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Install and hand tighten these hoses:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) The HPT hose [5]

IDC ALL PRE SB CFM56-7B 73-44

2) The BSV hose [10]

NOTE: Engine POST CFMI SB 73-044 do not have the BSV hose [10] installed.

IDC ALL

3) The TBV hose [12].

4) Use two wrenches to tighten the coupling nuts on the hoses above to 135 in-lb (15.3 N·m) - 150 in-lb (16.9 N·m).

NOTE: Engine with CFMI SB 73-044 do not have the BSV hose [10] installed.

IDC ALL POST SB CFM56-7B 73-44

(d) If it is necessary, do these steps to install the plug in place of the BSV hose [10].

NOTE: For the plug Part Number, refer to IPC 73-21-10.

1) Lubricate the threads of the plug with oil, D00623 [CP5066].

2) Install the plug in place of the BSV hose [10].

3) Tighten the plug to 135 in-lb (15.3 N·m)-150 in-lb (16.9 N·m).

IDC ALL

(e) Install and hand tighten these hoses:

1) The LPT hose [4]

2) The VSV hose (ROD) [6]

3) The VBV hose (CLOSED) [8]

4) The PCR hose [11].

5) Use two wrenches to tighten the coupling nuts on the hoses above to 270 in-lb (30.5 N·m) - 300 in-lb (33.9 N·m).

(f) Install and hand tighten these hoses:

1) The VSV hose (HEAD) [7]

2) The VBV hose (OPEN) [9].

3) Use two wrenches to tighten the coupling nuts on the hoses above to 450 in-lb (50.8 N·m) - 550 in-lb (62.1 N·m).

SUBTASK 73-11-01-210-003-F00

(16) Make sure to remove the electrical power from the airplane before the electrical connectors are installed (TASK 24-22-00-860-812).

SUBTASK 73-11-01-020-023-F00

(17) Connect these electrical connectors to the fuel pump package:

NOTE: If it is necessary, use soft-nose pliers to turn the connector nuts.

(a) Remove the protective covers from the plugs and the receptacles

(b) The DP0803 (J8) connector from the fuel filter differential pressure switch

(c) The DP0601 (J6) connector to the HMU

(d) The DP1207 (MW0312) connector to the HMU

(e) The DP0501 (J5) connector to the HMU

(f) The DP1203 (MW0312) connector to the HMU.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

I. Put the Airplane Back to Its Usual Condition

SUBTASK 73-11-01-410-004-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 73-11-01-840-009-F00

(2) Do these steps to put the airplane in a serviceable condition:

(a) Remove the DO NOT OPERATE tag, STD-858 from the start lever.

(b) Remove the DO NOT OPERATE tag, STD-858 from the BAT switch on panel P5-13.

SUBTASK 73-11-01-760-001-F00

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

J. Fuel Pump Package Installation Test

SUBTASK 73-11-01-720-003-F00

CAUTION MAKE SURE THE BOOST PUMPS ARE TURNED ON WHEN YOU DO TEST 12 (ACTUATORS TEST) OF THE POWER PLANT TEST REFERENCE TABLE, OR DAMAGE TO THE FUEL PUMP CAN OCCUR.

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 73-11-01-720-004-F00

CAUTION DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(2) If necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

K. Final Torque of the QAD Ring

SUBTASK 73-11-01-420-017-F00

CAUTION DO NOT TIGHTEN THE QAD BOLT TO MORE THAN 320 IN-LB (36 N.M). IF YOU TIGHTEN THE QAD BOLT TOO MUCH, YOU CAN CAUSE DAMAGE TO THE QAD RING.

(1) Tighten the QAD bolt [81] of the QAD ring [83].

(a) Tighten the QAD bolt [81] to 310 in-lb (35.0 N·m) - 320 in-lb (36.2 N·m).

(b) Loosen the QAD bolt [81].

(c) Tighten the QAD bolt [81] to 195 in-lb (22 N·m) - 230 in-lb (26 N·m).

(d) Measure the gap between the QAD ring [83] boss and the flange of the QAD ring [83] support.

1) If the gap is more than 1.0 in. (25.4 mm) or less than 0.25 in. (6.4 mm) replace the QAD ring [83].

(e) Install the safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the QAD bolt [81].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL PUMP PACKAGE - INSPECTION/CHECK

1. General

A. This procedure gives the visual inspection of the impeller rotation.

TASK 73-11-01-200-801-F00

2. The Visual Inspection of the Impeller Rotation

(Figure 601)

A. General

(1) This procedure contains the instructions for a visual examination of the fuel pump impeller and to make sure that it turns freely.

B. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
72-63-01-000-801-F00	Handcranking Drive Cover Removal (P/B 201)
72-63-01-400-801-F00	Handcranking Drive Cover Installation (P/B 201)
73-11-01-000-801-F00	Fuel Pump Package Removal (P/B 401)
73-11-01-400-801-F00	Fuel Pump Package Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1154	Container - 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lubrication flow screen	73-11-01-01-110	IDC 001-006
		73-11-01-01A-220	IDC 007-010, 012-999
2	Packing	73-11-01-01-115	IDC 001-006
		73-11-01-01A-225	IDC 007-010, 012-999
3	Packing	73-11-01-01-120	IDC 001-006
		73-11-01-01A-230	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

G. Prepare for the Inspection

SUBTASK 73-11-01-010-001-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 73-11-01-010-002-F00

(2) Do this task: Handcranking Drive Cover Removal, TASK 72-63-01-000-801-F00.

SUBTASK 73-11-01-020-001-F00

(3) Do these steps to get access to the impeller of the fuel pump:

(a) Do these steps to remove the lubrication flow screen [1] from the fuel pump:

1) Put a 5 gallon (19 liter) container, STD-1154 below the fuel pump to catch the fuel that drains from the fuel pump.

2) Remove the lubrication flow screen [1].

a) Remove and discard the packing [2] and packing [3].

H. Visual Inspection of the Impeller Rotation

SUBTASK 73-11-01-020-002-F00

(1) Do these steps to examine the impeller:

(a) Look through the opening where the lubrication flow screen (1) was removed to examine the impeller.

(b) Examine the impeller as you turn the hand cranking drive with a 3/4-inch square drive.

(c) Make sure that the fuel pump impeller turns freely.

(d) Make sure that the surface of the impeller is free of visible damage.

1) Visible damage is not acceptable.

(e) If the impeller is not in the limits, replace the fuel pump.

1) These are the tasks:

Fuel Pump Package Removal, TASK 73-11-01-000-801-F00,

Fuel Pump Package Installation, TASK 73-11-01-400-801-F00.

SUBTASK 73-11-01-020-003-F00

(2) Install the lubrication flow screen [1]]:

(a) Lubricate the new packing [2]and new packing [3] with oil, D00623 [CP5066].

(b) Install the new packings [2] and [3] in the grooves in the lubrication flow screen.

(c) Install the lubrication flow screen [1] in the fuel pump.

1) Tighten the lubrication flow screen [1] to 90-110 pound-inches (10.1-12.4 Newton meters).

(d) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the lubrication flow screen [1].

SUBTASK 73-11-01-410-001-F00

(3) Do this task: Handcranking Drive Cover Installation, TASK 72-63-01-400-801-F00.

SUBTASK 73-11-01-410-002-F00

(4) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

I. Lubrication Flow Screen Installation Test

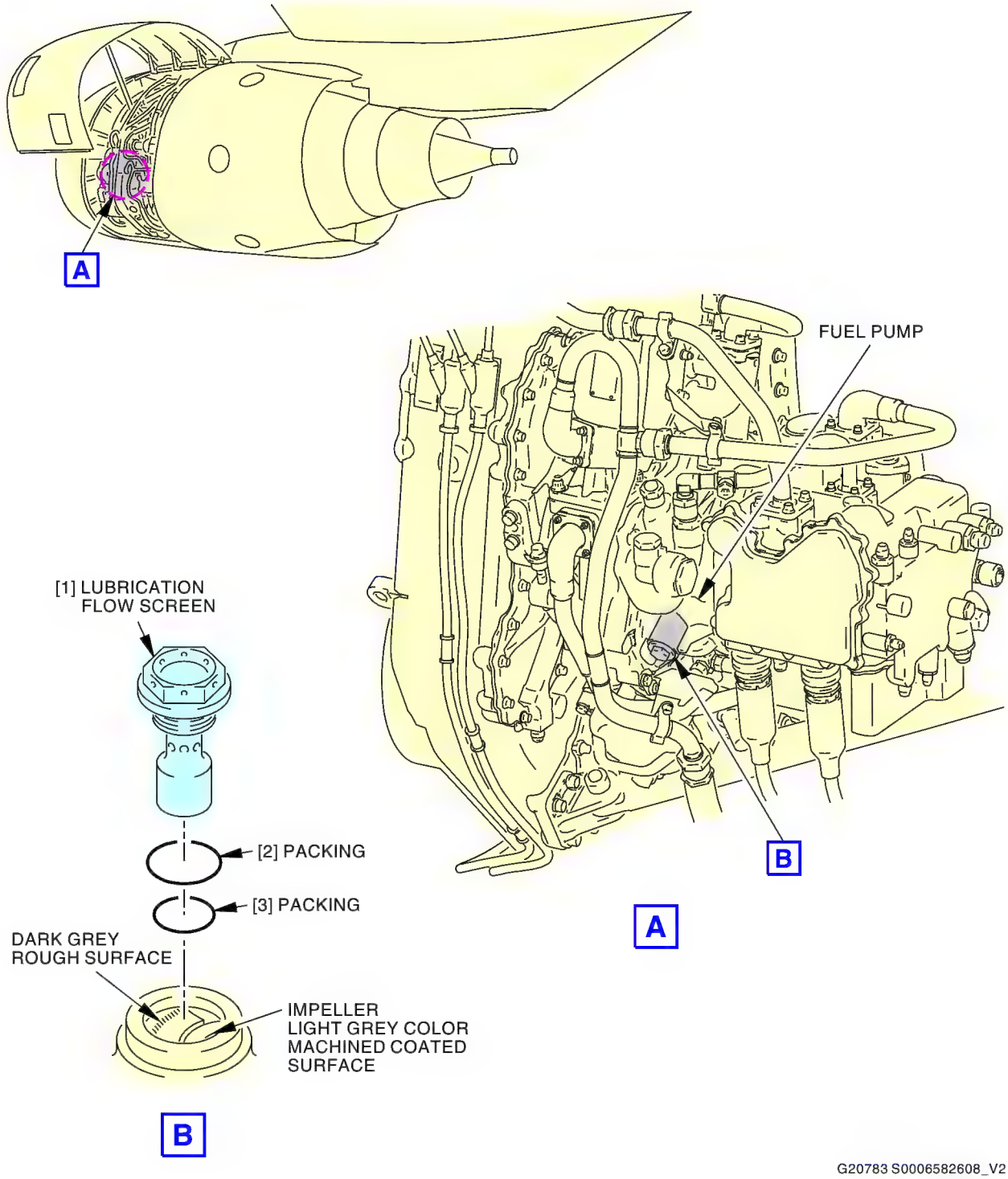
SUBTASK 73-11-01-720-001-F00

(1) Do the test that is listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

NOTE: The Minimum Idle Test with a visual examination for leaks is necessary for this procedure.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



G20783 S0006582608_V2

Check of the Impeller Rotation
Figure 601/73-11-01-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL FILTER - REMOVAL/INSTALLATION

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

(1) The removal of the fuel filter

(2) The installation of the fuel filter.

TASK 73-11-02-000-801-F00

2. Fuel Filter - Removal

(Figure 401, Figure 404, Figure 405)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) Each engine has one fuel filter element on the fuel pump assembly.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
FIM 73-05 TASK 801	Fuel FILTER BYPASS Light is ON - Fault Isolation

C. Tools/Equipment

Reference	Description
STD-1154	Container - 5 Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 73-11-02-840-001-F00

(1) Do these steps to prepare for the removal:

(a) Make sure the engine start lever is in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

(b) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: Bright when the valve is in transition or does not agree with the commanded position; Dim when the valve is closed and off when the valve is opened.

(c) Make sure the SPAR VALVE CLOSED light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the fuel spar valve has three positions: Bright when the valve is in transition or does not agree with the commanded position; Dim when the valve is closed and off when the valve is opened.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

NOTE: The removal of the electrical power is necessary while you disconnect the electrical and fluid connectors. You can reapply electrical power to the airplane after all of the electrical and fluid connectors are disconnected and the protective covers are installed.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

(e) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Fuel Filter Removal

NOTE: There are different configurations of the fuel filter cover.

NOTE: The steps to remove the fuel filter in Subtask 73–11–02–020–001–F00 are also applicable to 828300-5 Fuel Pump.

NOTE: The original design of the fuel pump filter cover attachment (bolts and fuel pump housing inserts) was canceled. It must be reworked by SB CFM56-7B-73-A0224 and SB CFM56-7B-73-0079.

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

SUBTASK 73-11-02-020-001-F00

(1) Do these steps to remove the fuel filter cover:

NOTE: This Subtask is for engines which have a fuel filter cover attachment with five D-Head bolts, five retaining rings, five washers, five nuts and one bolt with its insert (1 location) into the fuel pump housing.

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Do these steps to drain the fuel system:

1) Put the 5 gallon (19 liter) container, STD-1154, under the fuel pump assembly.
2) Cut and remove the safety wire or cable from the drain plug [4].
3) Remove the drain plug [4] from the fuel filter cover [6].
   a) Let the fuel drain in the container.
4) Remove and discard the packing [5] from the drain plug [4].
   a) Keep the drain plug [4] for the installation.

(b) Remove the MW0312 wire harness from the Omega clip that is just to the left of the fuel filter cover [6].

(c) Do these steps to remove the fuel filter cover [6]:

1) Loosen and remove the bolt [2] and flat washer [3] that hold the fuel filter cover [6].
   a) Do an inspection of the bolt [2] for signs of thread damage.
      <1> If there is damage, discard and replace it.
   b) Do an inspection of the flat washer [3] for signs of damage (nicks, flatness condition).
      <1> If there is damage, discard and replace it.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224 (Continued)

2) Loosen and remove the five nuts [15] and five flat washers [14] that hold the fuel filter cover [6].

NOTE: The five D-Head bolts are captive in the fuel filter cover housing.

a) Do an inspection of the nuts [15] for signs of thread damage.

<1> If there is damage, discard and replace them.

b) Do an inspection of the flat washers [14] for signs of damage (nicks, flatness condition).

<1> If there is damage, discard and replace them.

3) Remove the fuel filter cover [6] from the fuel filter housing.

NOTE: When you remove the fuel filter cover, the filter element remains attached to it.

a) Do an inspection of the main fuel pump housing insert for signs of damage for a pulled out insert movement, and the thread insert damage.

NOTE: There is only one insert in the main fuel pump housing, located in the hole adjacent to the nameplate.

<1> For 828300–4 fuel pump, if the insert is damaged, replace the fuel pump or apply SB CFM56-7B-73-0079.

<2> For 828300–5 fuel pump, if the insert is damaged, replace the fuel pump or apply SB CFM56-7B-73-0212.

IDC ALL POST SB 737-CFM56-7B-73-0212 AND PRE SB 737-CFM56-7B-73-0224

<3> For 828300–8 fuel pump, if the insert is damaged, replace the fuel pump or apply SB CFM56-7B-73-0224.

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

b) Do an inspection of the attached parts as follows:

<1> Do an inspection of the five D-Head bolts [12] for signs of damage.

<a> If there is damage, discard and replace them with the retaining ring [13].

4) Remove and discard the packing [7] from the fuel filter cover [6].

5) Remove the fuel filter element [11] from the fuel filter cover [6].

a) Do the inspection of the fuel filter cover [6] for contamination.

b) Do the inspection the fuel filter element [11] for contamination.

<1> If you find usual contamination.

IDC ALL PRE SB CFM56-7B-73-078 AND (POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224)

<a> Discard the fuel filter element [11] and the packing [1] and the packing [10] that are attached to the filter element [11].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB CFM56-7B-73-078 AND (POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224)

<b> Discard the fuel filter element [11] and the packings that are attached to the filter element [11].

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

NOTE: Make sure that the packing and the packing are attached to the fuel filter element and not stuck in the filter housing.

c) If you find large quantities of contamination.

<1> Do this task: FIM 73-05 TASK 801.

IDC ALL POST SB CFM56-7B-73-0079

SUBTASK 73-11-02-020-002-F00

WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

NOTE: This Subtask is for engines which have a fuel filter cover attachment with five D-Head bolts, five retaining rings, five flat washers, five nuts and one bolt with one washer, one self-aligning washer and one self-aligning nut (the main fuel pump reworked by SB CFM56-7B-73-0079).

(2) Do these steps to remove the fuel filter cover [6].

(a) Do these steps to drain the fuel system:

1) Put the 5 gallon (19 liter) container, STD-1154, under the fuel pump assembly.

2) Cut and remove the safety wire or cable from the drain plug [4].

3) Remove the drain plug [4] from the fuel filter cover [6].

a) Let the fuel drain in the container.

4) Remove and discard the packing [5] from the drain plug [4].

a) Keep the drain plug [4] for installation.

(b) Remove the MW0312 wire harness from the Omega clip that is just to the left of the fuel filter cover [6].

(c) Do these steps to remove the fuel filter cover [6]:

1) Loosen and remove the five nuts [15] and five flat washers [14] that hold the fuel filter cover [6].

NOTE: If there is damage, discard and replace them.

a) Do an inspection of the nuts [15] for signs of thread damage.

<1> If there is damage, discard and replace it.

b) Do an inspection of the flat washers [14] for signs of damage (nicks, flatness condition).

<1> If there is damage, discard and replace it.

2) Loosen and remove the bolt [16], flat washers [17], self-aligning washer [18], and self-aligning nut [19] that hold the fuel filter cover [6].

a) Do an inspection of bolt [16] for signs of thread damage.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB CFM56-7B-73-0079 (Continued)

<1> If there is damage, discard and replace it.

b) Do an inspection of the flat washers [17] for signs of damage (nicks, flatness condition).

<1> If there is damage, discard and replace it.

c) Do an inspection of the self-aligning washer [18] for signs of thread and spherical face damage.

<1> If there is damage, discard and replace it.

d) Do an inspection of the self-aligning nut [19] for signs of thread and spherical face damage.

<1> If there is damage, discard and replace it.

3) Remove the fuel filter cover [6] from the fuel filter housing.

NOTE: When you remove the fuel filter cover, the fuel filter element remains attached to it.

a) Do an inspection of the attached parts as follows:

<1> Do an inspection of the five D-Head bolts [12] for signs of thread damage.

<a> If there is damage, discard and replace them with the retaining rings [13].

4) Remove and discard the packing [7] from the fuel filter cover [6].

5) Remove the fuel filter element [11] from the fuel filter cover [6].

6) Do an inspection of the fuel filter cover [6] for contamination.

7) Do an inspection of the fuel filter element [11] for contamination.

a) If you find usual contamination.

IDC ALL PRE SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

<1> Discard the fuel filter element [11] and the packings packing [1] and packing [10].

IDC ALL POST SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

<2> Discard the fuel filter element [11] and packings attached to it.

IDC ALL POST SB CFM56-7B-73-0079

NOTE: Make sure that the packings are attached to the fuel filter element and not stuck in the fuel filter housing.

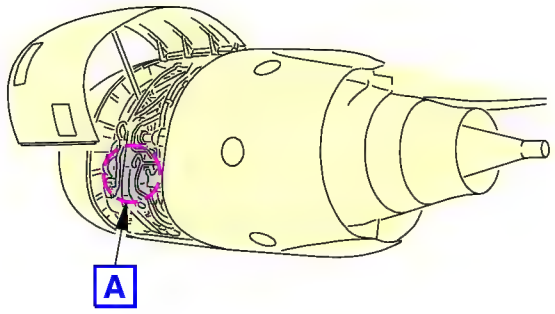
8) If you find large quantities of contamination.

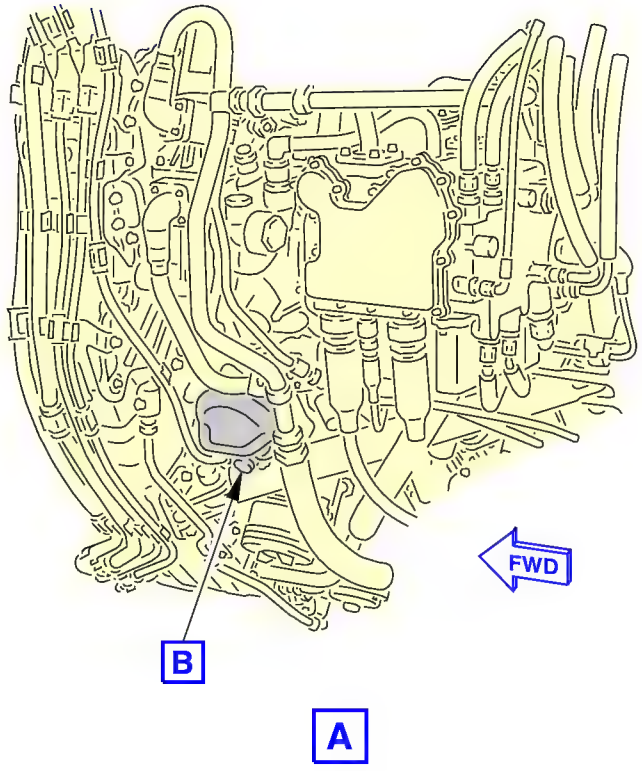
a) Do this task: FIM 73-05 TASK 801.

IDC ALL

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

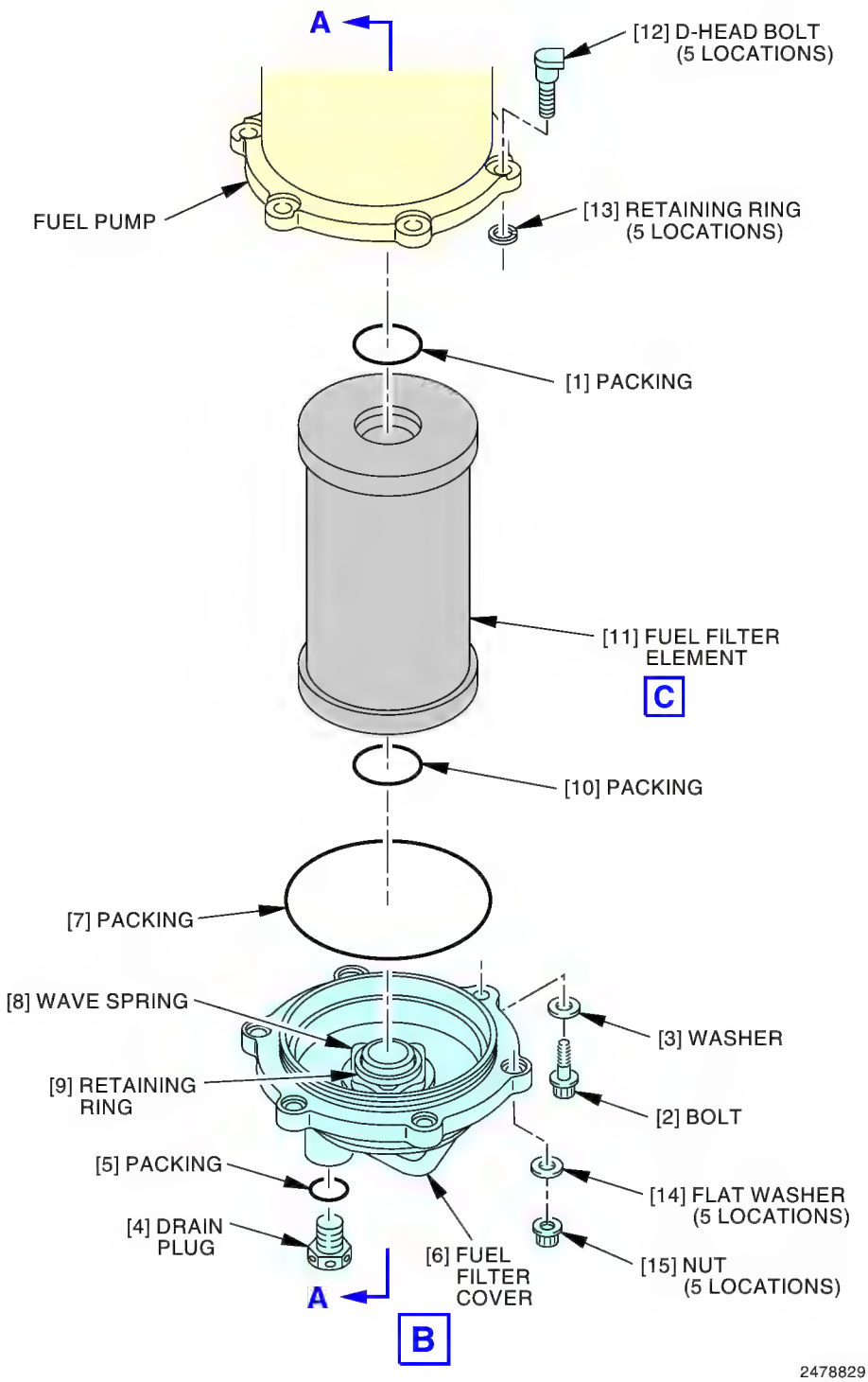




MM-00203-00-B
E91820 S0006582614_V4

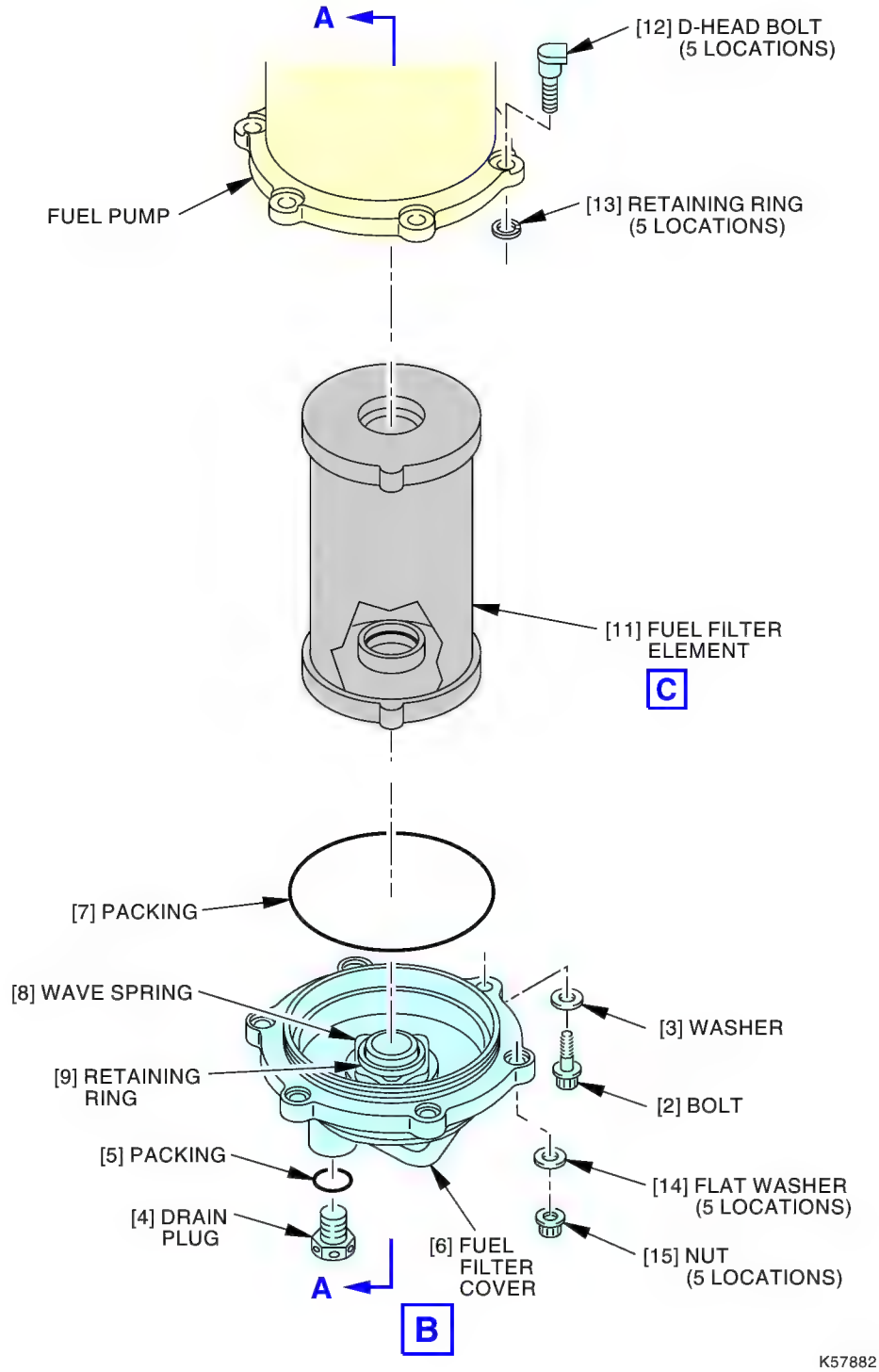
Fuel Filter Installation
Figure 401/73-11-02-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



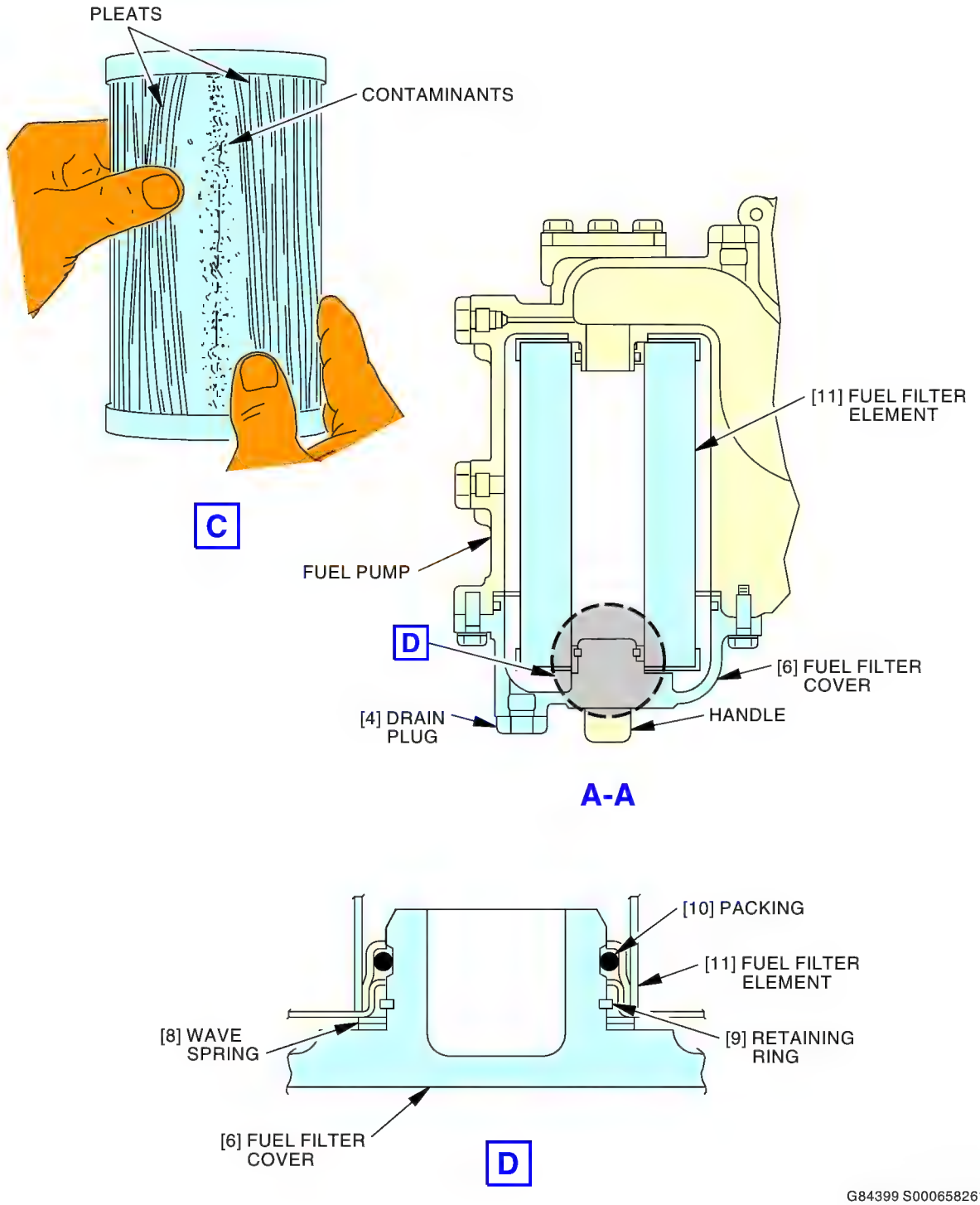
Fuel Filter Installation
Figure 402/73-11-02-990-805-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



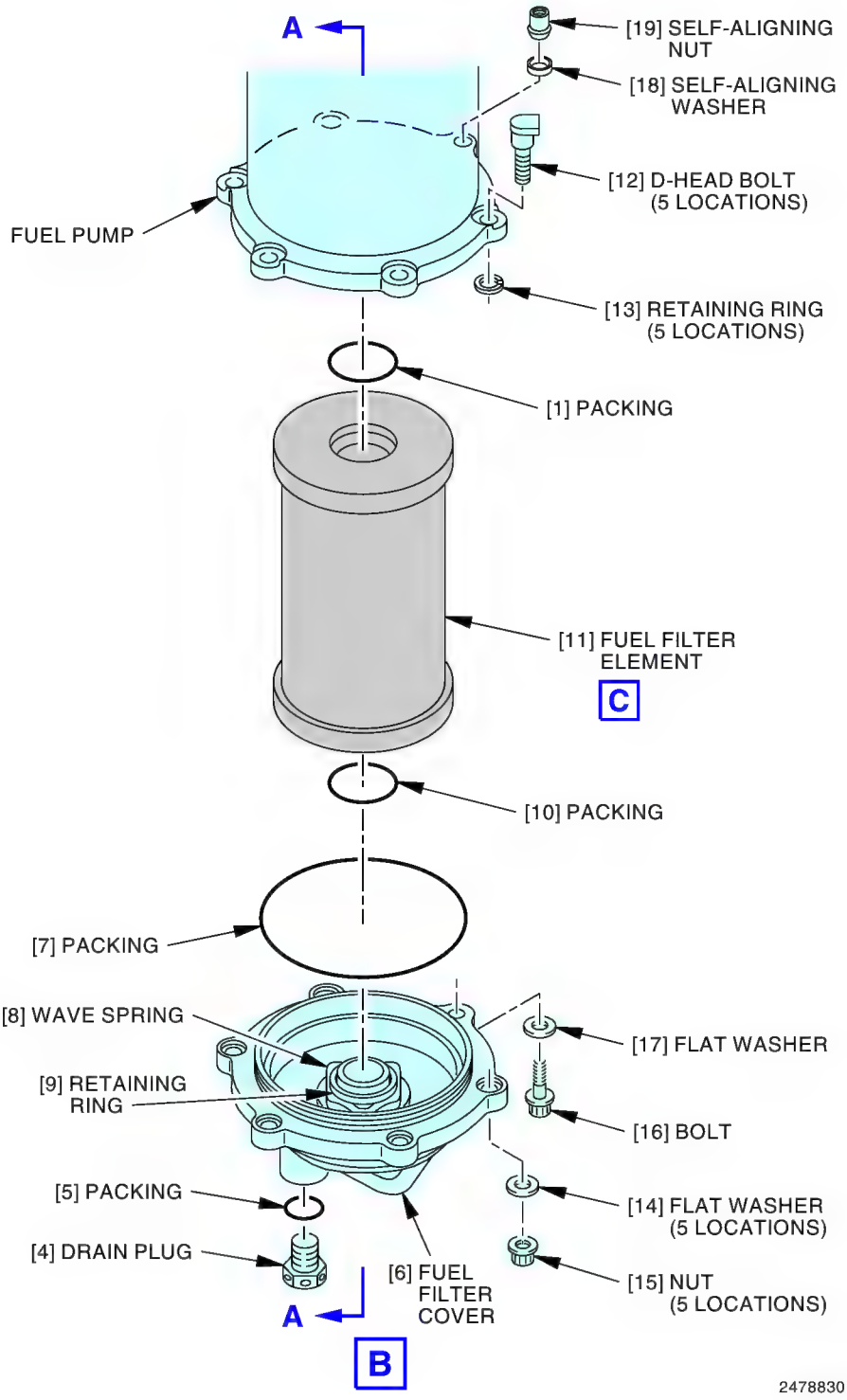
Fuel Filter Installation
Figure 402/73-11-02-990-805-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



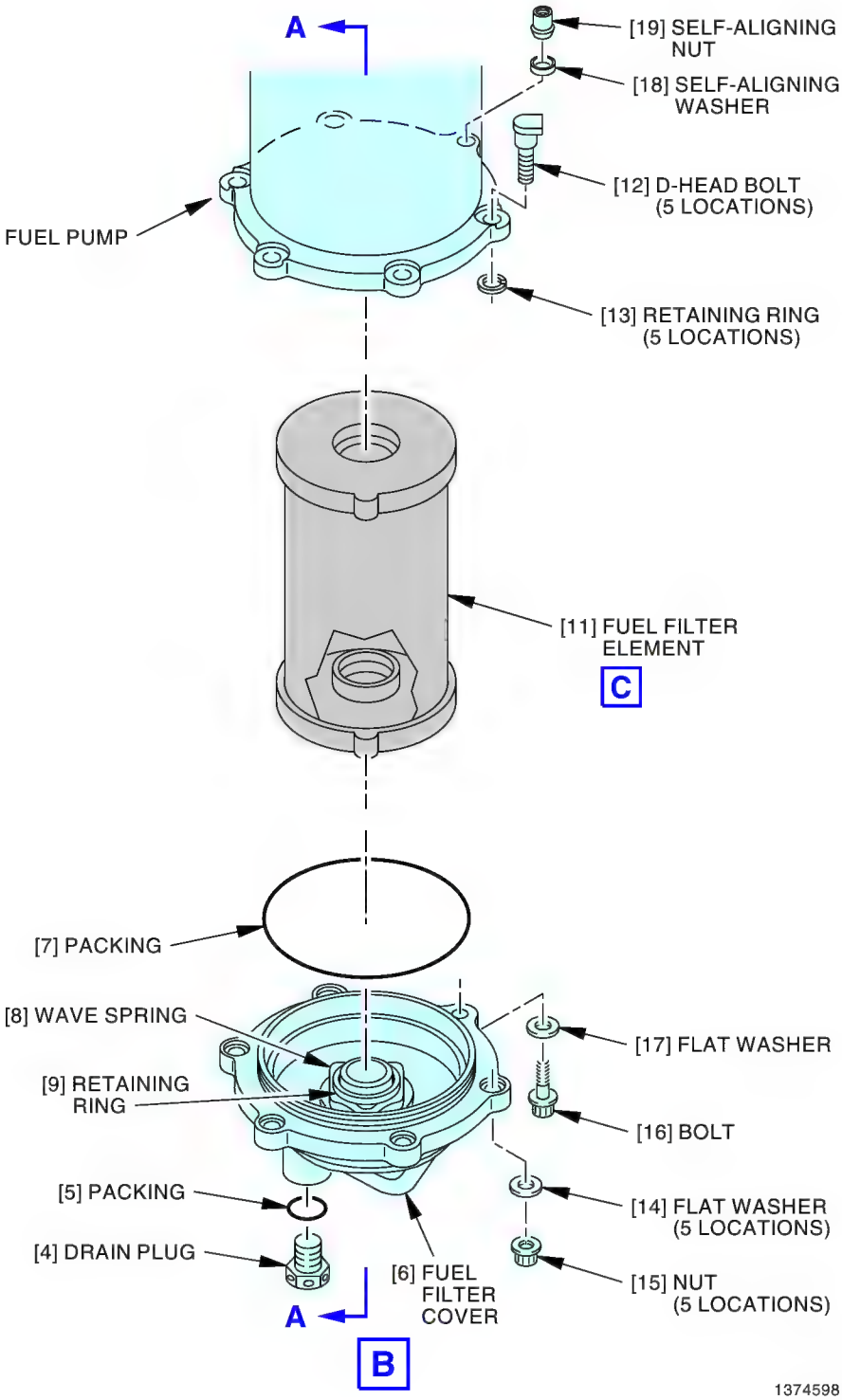
Fuel Filter Installation
Figure 403/73-11-02-990-806-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



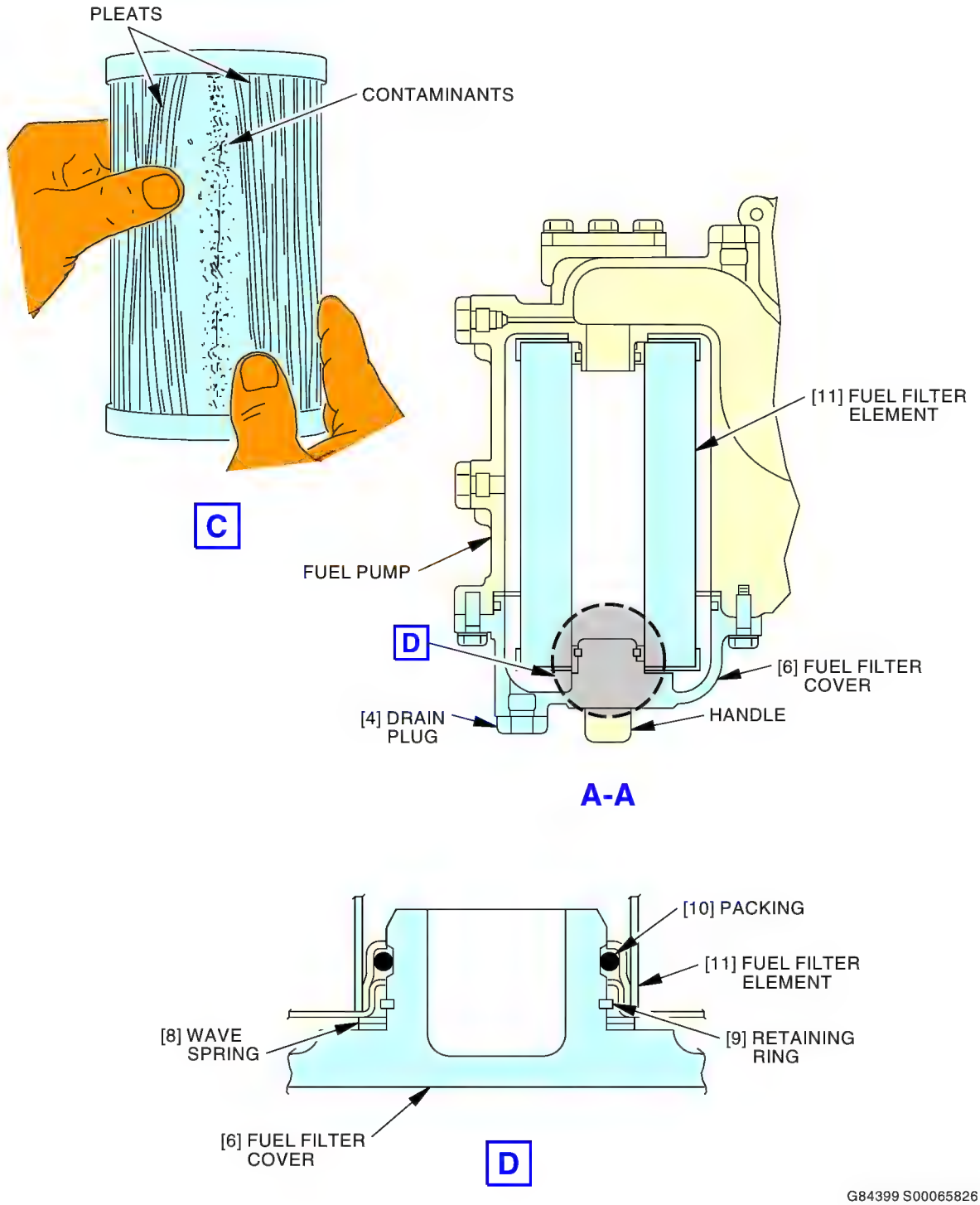
Fuel Filter Installation
Figure 404/73-11-02-990-804-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



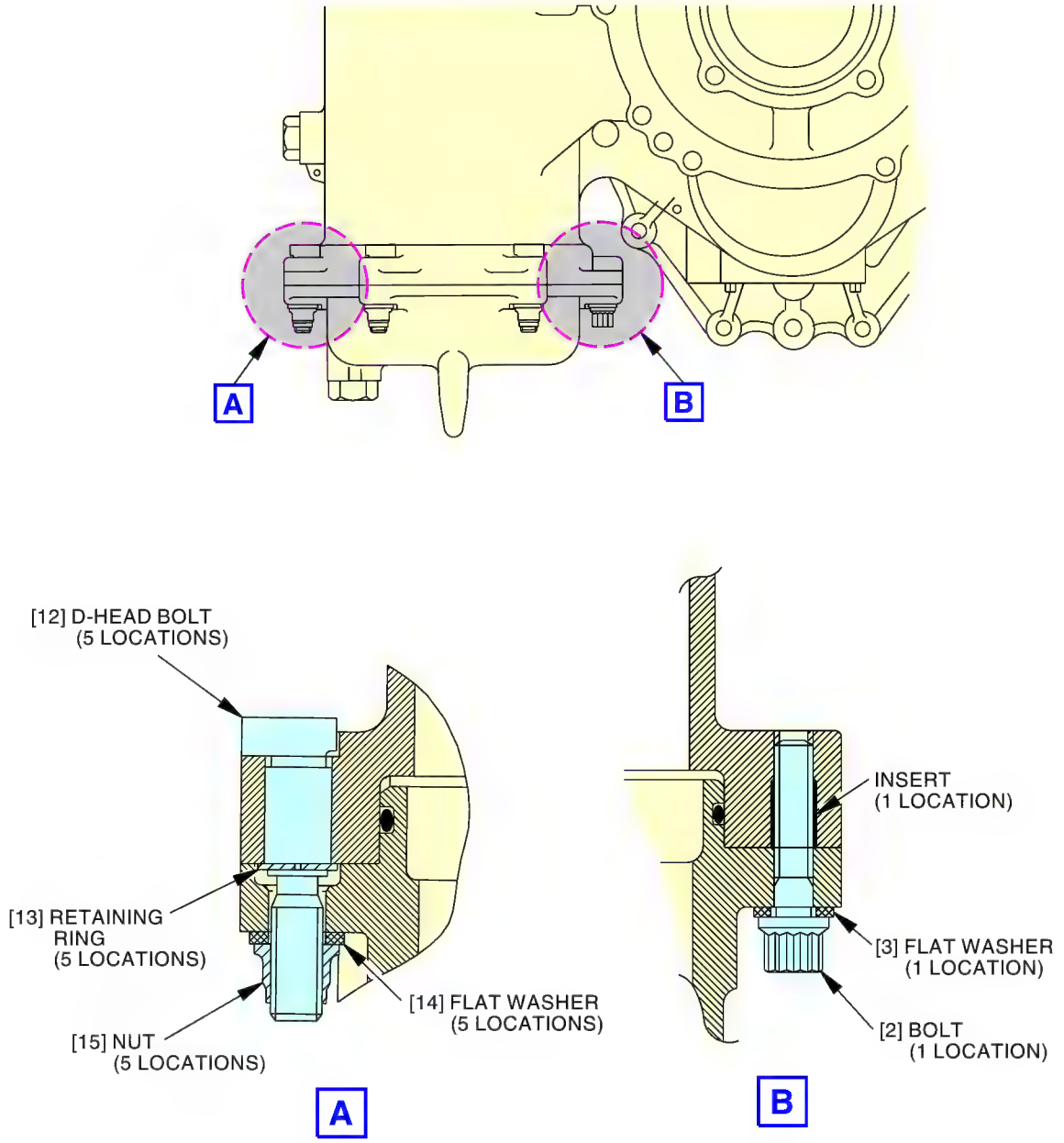
Fuel Filter Installation
Figure 404/73-11-02-990-804-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Filter Installation
Figure 404/73-11-02-990-804-F00 (Sheet 3 of 3)

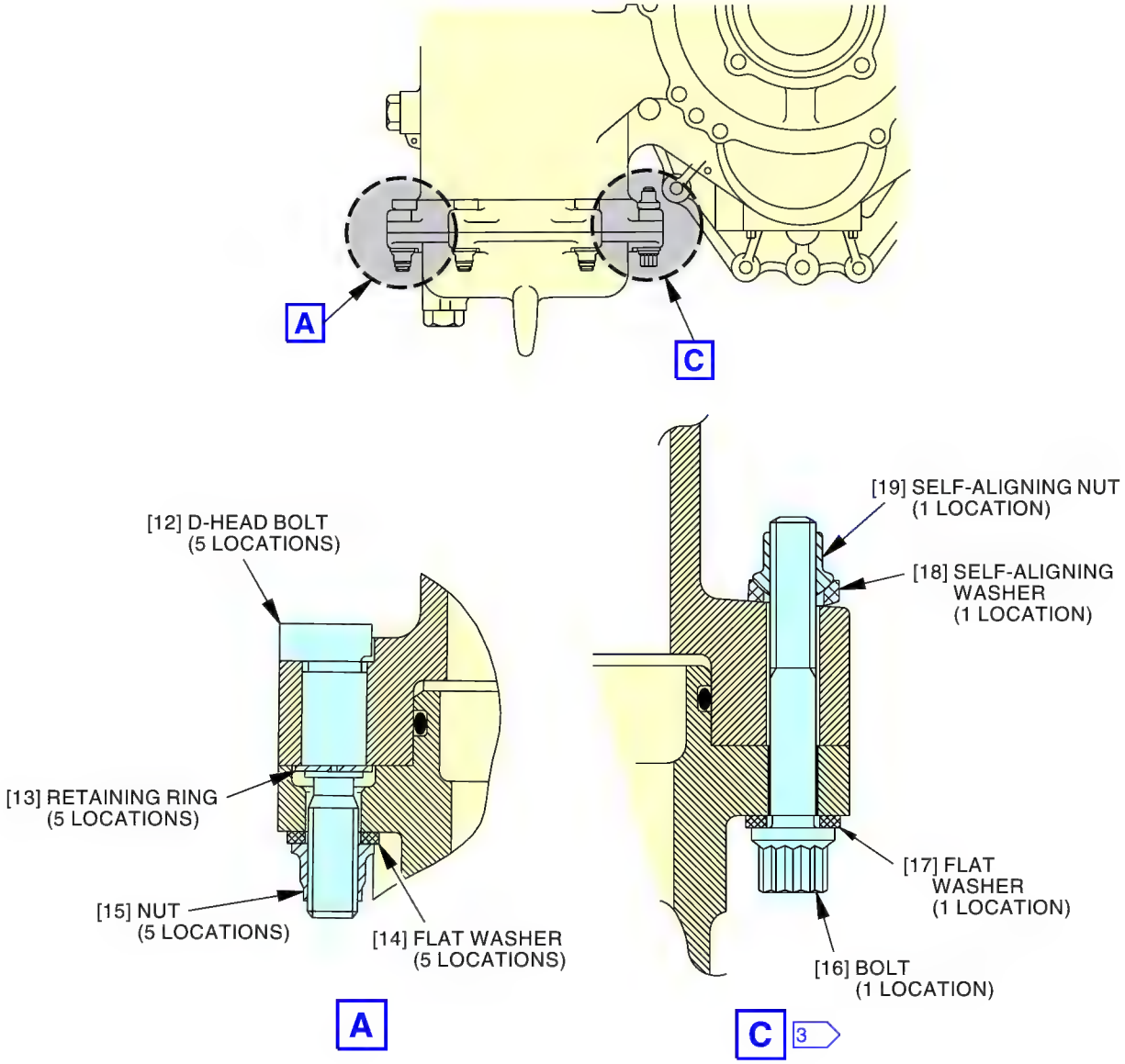
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



1374765 S0000248824_V2

Fuel Filter Attachment Installation
Figure 405/73-11-02-990-802-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



NOTE:

3 DO NOT INTERMIX THE DIFFERENT SUPPLIERS HARDWARE (SELF-ALIGNING WASHER AND SELF-ALIGNING NUT FROM KIT PH030035-4 OR KIT NAS1727-4D) AND BOLT.

1374445 S0000248825_V2

Fuel Filter Attachment Installation
Figure 405/73-11-02-990-802-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-02-400-801-F00

3. Fuel Filter - Installation

(Figure 401, Figure 404, Figure 405)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
70-20-02-400-801-F00	Tightening Practices and Torque Values (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
B00676 [CP1041]	Alcohol - Isopropyl	
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G02272	Fuel - Turbine, Aviation (Grades JP-4, JP-5, JP-5/JP-8ST)	MIL-DTL-5624
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A
G51056	Fuel - Standard Specification For Aviation Turbine Fuels (Jet A And Jet A-1)	ASTM D1655

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	73-11-01-01-100	IDC 001-006
		73-11-01-01A-210	IDC 007-010, 012-999
4	Plug	73-11-01-01-060	IDC 001-006
		73-11-01-01A-110	IDC 007-010, 012-999
5	Packing	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999
7	Packing	73-11-01-01-085	IDC 001-006
		73-11-01-01A-195	IDC 007-010, 012-999
10	Packing	73-11-01-01-100	IDC 001-006
		73-11-01-01A-210	IDC 007-010, 012-999
11	Filter element	73-11-01-01-105	IDC 001-006
		73-11-01-01A-215	IDC 007-010, 012-999

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Installation

SUBTASK 73-11-02-840-002-F00

(1) Do these steps to prepare for the installation:

WARNING DO NOT USE THE SOLVENT NEAR AN OPEN FLAME. THE SOLVENT IS FLAMMABLE. DO NOT BREATHE THE FUMES OF THE SOLVENT. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING ISOPROPYL ALCOHOL IS TOXIC AND FLAMMABLE. USE PERSONAL PROTECTION EQUIPMENT. USE IN A WELL-VENTILATED AREA.

(a) Use fuel, G02272, alcohol, B00676 [CP1041] or aviation turbine fuel, G51056, and cotton wiper, G00034, to clean the fuel filter housing and the fuel filter cover [6].

(b) Examine all mating surfaces and adjacent areas of the fuel filter housing to make sure that they are clean and in a good condition.

F. Fuel Filter Installation

NOTE: There are different configurations of the fuel filter cover.

NOTE: The steps to install the fuel filter in Subtask 73–11–02–420–001–F00 are also applicable to 828300-5 Fuel Pump.

NOTE: The original design of the fuel pump filter cover attachment (bolts and fuel pump housing inserts) was cancelled. It must be reworked by SB CFM56-7B-73-A0224 and SB CFM56-7B-73-0079.

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

SUBTASK 73-11-02-420-001-F00

(1) Do these steps to install the fuel filter:

(a) Install the packing [7] in the fuel filter cover [6]:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate a new packing [7] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

2) Install the packing [7] in the groove of the fuel filter cover [6].

(b) Lubricate and install the new packing [1] and new packing [10] on the new fuel filter element [11]:

1) Lubricate the new packing [1] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

2) Install the packing [1] in the groove at the top of the new fuel filter element [11].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224 (Continued)

3) Lubricate the packing [10] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

4) Install the packing [10] in the groove at the bottom of the fuel filter element [11].

IDC ALL POST SB CFM56-7B-73-078 AND (POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224)

(c) Lubricate the packings of the new fuel filter element [11] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

NOTE: The packings are already installed by the manufacturer in their grooves on the new fuel filter element.

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

(d) Lightly lubricate the threads of the bolt [2] with graphite mineral vaseline, D00601 [CP2101].

(e) Lightly lubricate the threads of the five D-Head bolts [12] with graphite mineral vaseline, D00601 [CP2101].

CAUTION MAKE SURE THAT YOU CORRECTLY INSTALL THE WAVE SPRING AND THE RETAINING RING ON THE FUEL FILTER COVER. IF YOU DO NOT INSTALL CORRECTLY, DAMAGE TO THE FUEL FILTER ELEMENT CAN OCCUR.

(f) Make sure that the wave spring [8] and the retaining ring [9] are correctly installed into the fuel filter cover [6].

IDC ALL PRE SB CFM56-7B-73-078 AND (POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224)

(g) Carefully install the fuel filter element [11] in the fuel filter cover [6].

1) Look down the center of the filter element [11] for signs of extrusion and/or cut packing at the filter cover/packing interface.

2) Make sure that the packing [10] stays in its correct position in the groove in the fuel filter element [11].

3) Make sure that the packing [7] stays in its correct position in the groove in the fuel filter cover [6].

4) Make sure that the fuel filter element [11] does not move.

IDC ALL POST SB CFM56-7B-73-078 AND (POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224)

(h) Carefully install the fuel filter element [11] in the fuel filter cover [6].

1) Look down the center of the filter element [11] for signs of extrusion and/or cut packing at the filter cover/packing interface.

2) Adjust the tabs of the fuel filter element [11] to the fuel filter cover.

3) Make sure that the packings stay in their grooves in the fuel filter element [11].

4) Make sure that the packing [7] stays in its correct position in the groove in the fuel filter cover [6].

5) Make sure that the fuel filter element [11] does not move.

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224 (Continued)

(i) Carefully install the fuel filter cover [6] and the fuel filter element [11] into the fuel filter housing.

1) Make sure that the fuel filter element [11] is correctly installed on the guide of the fuel filter housing.

IDC ALL POST SB CFM56-7B-73-078 AND (POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224)

2) Adjust the tabs of the fuel filter element [11] to the ribs of the fuel filter housing.

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224

CAUTION

DO NOT USE THE BOLTS TO HELP ENGAGE THE FILTER COVER. DAMAGE ON THE INSERT WILL OCCUR.

3) Make sure that the fuel filter cover [6] is correctly engaged into the fuel filter housing.

(j) Before the bolt installation, make sure that the cover is correctly installed against the housing flange.

NOTE: A wood or plastic hammer may help to engage the cover, if it is necessary.

(k) Install the five retaining rings [13], five flat washers [14], and five nuts [15] on the five D-Head bolts [12] that hold the fuel filter cover [6] to the fuel filter housing.

1) Make sure that the nuts [15] screw freely by hand as follows:

NOTE: No tool is permitted.

a) Turn each nut for a minimum of two full turns.

<1> If the attached part is in a good condition, it should not be possible to fully hand tighten the nut.

CAUTION

BE CAREFUL WHILE YOU TIGHTEN THE BOLTS THAT HOLD THE FUEL FILTER COVER TO THE HOUSING. MAKE SURE THAT YOU USE THE CORRECT TORQUE PROCEDURE WHEN YOU TIGHTEN THE BOLTS. IF YOU DO NOT OBEY INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE FUEL FILTER COVER OR CAUSE A FUEL LEAK.

2) Tighten the five nuts [15] to 70 in-lb (8 N·m) – 80 in-lb (9 N·m), do this task: Tightening Practices and Torque Values, TASK 70-20-02-400-801-F00.

(l) Install the bolts [2] and the flat washer [3] that hold the fuel filter cover [6] to the fuel filter housing.

NOTE: Only one bolt is used in the hole adjacent to the nameplate.

1) Make sure that the bolt engages freely by hand as follows:

NOTE: No tool is permitted.

a) Hold the bolt head between your fingers, and turn the bolt for a minimum of two full turns.

<1> If the insert is in a good condition, it should not be possible to fully hand tighten the bolt.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB 737-CFM56-7B-73-0212 OR POST SB 737-CFM56-7B-73-0224 (Continued)

CAUTION TIGHTEN THE BOLTS TO THE CORRECT TORQUE. THE INCORRECT TORQUE CAN CAUSE DAMAGE TO THE COMPONENTS. LARGE QUANTITIES OF FUEL LEAKAGE WILL OCCUR.

2) Tighten the bolt [2] to 70 in-lb (8 N·m) – 80 in-lb (9 N·m), do this task: Tightening Practices and Torque Values, TASK 70-20-02-400-801-F00.

(m) Install the MW0312 wire harness in the Omega clip that is immediately to the left of the fuel filter cover [6].

(n) Install the drain plug [4] on the fuel filter cover [6]:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate a new packing [5] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].
2) Install the packing [5] in the groove of the drain plug [4].
3) Lubricate the threads of the drain plug [4] with oil, D00623 [CP5066].
4) Install the drain plug [4] in the fuel filter cover [6].
   a) Tighten the drain plug [4] to 45 in-lb (5 N·m) – 55 in-lb (6 N·m).
5) Install the safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [4].

IDC ALL POST SB CFM56-7B-73-0079

SUBTASK 73-11-02-420-002-F00

WARNING DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE SKIN.

(2) Do these steps to install the fuel filter cover [6].

NOTE: This Subtask is for engines which have a fuel filter cover attachment with five D-Head bolts, five retaining rings, five flat washers, five nuts, one bolt, one flat washer, one self-aligning washer, and one self-aligning nut (the main fuel pump reworked by SB CFM56-7B-73-079).

(a) Install the packing [7] in the fuel filter cover [6].
   1) Lubricate the packing [7] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].
   2) Install the packing [7] in the groove of the fuel filter cover [6].

IDC ALL PRE SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

(b) Lubricate and install the new packing [1] and the new packing [10] on the new fuel filter element [11].
   1) Lubricate the new packing [1] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].
   2) Install the packing [1] in the groove at the top of the new fuel filter element [11].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL PRE SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079 (Continued)

3) Lubricate the new packing [10] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

4) Install the packing [10] in the groove at the bottom of the new fuel filter element [11].

IDC ALL POST SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

(c) Lubricate the packings of the new fuel filter element [11] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

NOTE: The packings are already installed by the manufacturer in their grooves on the new fuel filter element [11].

IDC ALL POST SB CFM56-7B-73-0079

(d) Lightly lubricate the threads of the bolt [16] and the self-aligning washer [18] with graphite mineral vaseline, D00601 [CP2101].

(e) Lightly lubricate the threads of the five D-Head bolts [12] with graphite mineral vaseline, D00601 [CP2101].

CAUTION MAKE SURE THAT THE WAVE SPRING AND THE RETAINING RING ARE CORRECTLY INSTALLED ON THE FUEL FILTER COVER. IF THE WAVE SPRING AND THE RETAINING RING ARE NOT CORRECTLY INSTALLED, IT CAN CAUSE DAMAGE TO THE FUEL FILTER ELEMENT.

(f) Make sure that the wave spring [8] and the retaining ring [9] are correctly installed into the fuel filter cover [6].

IDC ALL PRE SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

(g) Carefully install the fuel filter element [11] on the fuel filter cover [6].

1) Make sure that the packing [10] stays in its correct position in the groove in the fuel filter element [11].

2) Make sure that the packing [7] stays in its correct position in the groove in the fuel filter cover [6].

3) Make sure that the fuel filter element [11] does not move.

IDC ALL POST SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

(h) Carefully install the fuel filter element [11] on the fuel filter cover [6].

1) Adjust the tabs of the fuel filter element [11] to the fuel filter cover.

2) Make sure that the packings stay in their grooves in the fuel filter element [11].

3) Make sure that the packing [7] stays in its correct position in the groove in the fuel filter cover [6].

4) Make sure that the fuel filter element [11] does not move.

IDC ALL POST SB CFM56-7B-73-0079

(i) Carefully install the fuel filter cover [6] with its fuel filter element [11] into the fuel filter housing.

1) Make sure that the fuel filter element [11] is correctly installed on the guide of the fuel filter housing.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB CFM56-7B-73-078 AND POST SB CFM56-7B-73-0079

2) Adjust the tabs of the fuel filter element [11] to the ribs of the fuel filter housing.

IDC ALL POST SB CFM56-7B-73-0079

CAUTION DO NOT USE THE BOLTS TO HELP ENGAGE THE FILTER COVER. DAMAGE ON THE INSERT WILL OCCUR.

3) Make sure that the fuel filter cover [6] is correctly engaged into the fuel filter housing.

NOTE: A wood or plastic hammer may help to engage the cover, if it is necessary.

(j) Before the bolts installation, make sure that the cover is correctly installed against the housing flange.

(k) Install the five retaining rings [13], the five flat washers [14], and the five nuts [15] on the five D-Head bolts [12] that hold the fuel filter cover [6] to the fuel filter housing.

1) Make sure that the nuts [15] screw freely by hand as follows:

NOTE: No tool is permitted.

a) Turn each nut for a minimum of two full turns.

<1> If the attached part is in a good condition, it should not be possible to fully hand tighten the nut.

CAUTION TIGHTEN THE BOLTS TO THE CORRECT TORQUE. THE INCORRECT TORQUE CAN CAUSE DAMAGE TO THE COMPONENTS. LARGE QUANTITIES OF FUEL LEAKAGE WILL OCCUR.

b) Tighten the five nuts [15] to 70 in-lb (8 N·m) – 80 in-lb (9 N·m), do this task: Tightening Practices and Torque Values, TASK 70-20-02-400-801-F00.

(l) Install the bolt [16], flat washer [17], self-aligning washer [18], and self-aligning nut [19] that hold the fuel filter cover [6] to the fuel filter housing.

NOTE: There are two attachment designs that are not interchangeable. The spherical profile of the nuts and washers is different (two suppliers hardware).

NOTE: This step is for the fuel filter cover attachment with Kit PH030035-4 or Kit NAS1727-4D.

NOTE: Only one bolt is used in the hole adjacent to the nameplate.

1) Lubricate the head faces of the bolt [16] in contact with the flat washer [17].

a) Lubricate the threads of the bolt and the spherical side of the self-aligning nut [19] with graphite mineral vaseline, D00601 [CP2101].

2) Install the bolt [16], flat washer [17], self-aligning washer [18] and the self-aligning nut [19] for each assembly configuration.

NOTE: An improper bolt, nut and washer installation can lead to damages. Pay special attention to the self-aligning nut and washer installation.

NOTE: Do not intermix the bolt, self-aligning nut and self-aligning washer from the different suppliers on the fuel pump which attach the fuel filter cover.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB CFM56-7B-73-0079 (Continued)

CAUTION TIGHTEN THE BOLTS TO THE CORRECT TORQUE. THE INCORRECT TORQUE CAN CAUSE DAMAGE TO THE COMPONENTS. LARGE QUANTITIES OF FUEL LEAKAGE WILL OCCUR.

3) Tighten the bolt [16] and self-aligning nut [19] to 70 in-lb (8 N·m) – 80 in-lb (9 N·m), do this task: Tightening Practices and Torque Values, TASK 70-20-02-400-801-F00.

WARNING DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE SKIN.

(m) Install the MW0312 wire harness in Omega clip that is immediately to the left of the fuel filter cover [6].

1) Install the drain plug [4] on the fuel filter cover [6]:

a) Lubricate the new packing [5] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

b) Install the packing [5] in the groove of the drain plug [4].

c) Lubricate the threads of the drain plug [4] with oil, D00623 [CP5066].

d) Install the drain plug [4] in the fuel filter cover [6].

<1> Tighten the drain plug [4] to 45 in-lb (5 N·m) – 55 in-lb (6 N·m).

e) Install the safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [4].

IDC ALL

G. Put the Airplane in a Serviceable Condition

SUBTASK 73-11-02-840-003-F00

(1) Do these steps to put the airplane in a serviceable condition:

(a) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(b) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

(c) Remove the DO-NOT-OPERATE tag from the applicable engine start lever.

H. Fuel Filter Replacement Test

SUBTASK 73-11-02-790-001-F00

CAUTION DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(1) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL NOZZLE FILTER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES

(1) The removal of the fuel nozzle filter (SAC).

(2) The installation of the fuel nozzle filter (SAC).

TASK 73-11-03-000-802-F00

2. Fuel Nozzle Filter Removal (SAC)

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-11-03-840-005-F00

(1) Make sure that the engine fuel valves are closed:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure that the start levers are in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable start lever.

(c) Make sure that the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

SUBTASK 73-11-03-840-006-F00

(2) Prepare the airplane for the procedure:

(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

(b) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES (Continued)

E. Procedure

SUBTASK 73-11-03-020-002-F00

(1) Remove the fuel outlet tube:

(a) Remove the nut [6], bolt [8], and clamp [7] that hold the fuel outlet tube [5] to the bracket.

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(b) Put a 5-gallon (19-liter) fuel resistant container, STD-1054 below the connection between the fuel outlet tube [5] and the 9:00 O'clock strut tube.

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(c) Use two wrenches to disconnect the fuel outlet tube [5] from the 9:00 O'clock strut tube.

1) Let the unwanted fuel flow into the container.

(d) Use two wrenches to disconnect the outlet tube [5] from the fuel nozzle filter [4].

1) Remove the outlet tube [5].

(e) Install protective covers on the fuel outlet tube [5], the 9:00 O'clock strut tube, and the fuel nozzle filter [4].

SUBTASK 73-11-03-020-003-F00

(2) Remove the fuel nozzle filter:

(a) Use two wrenches to disconnect the fuel inlet tube [1] from the fuel nozzle filter [4].

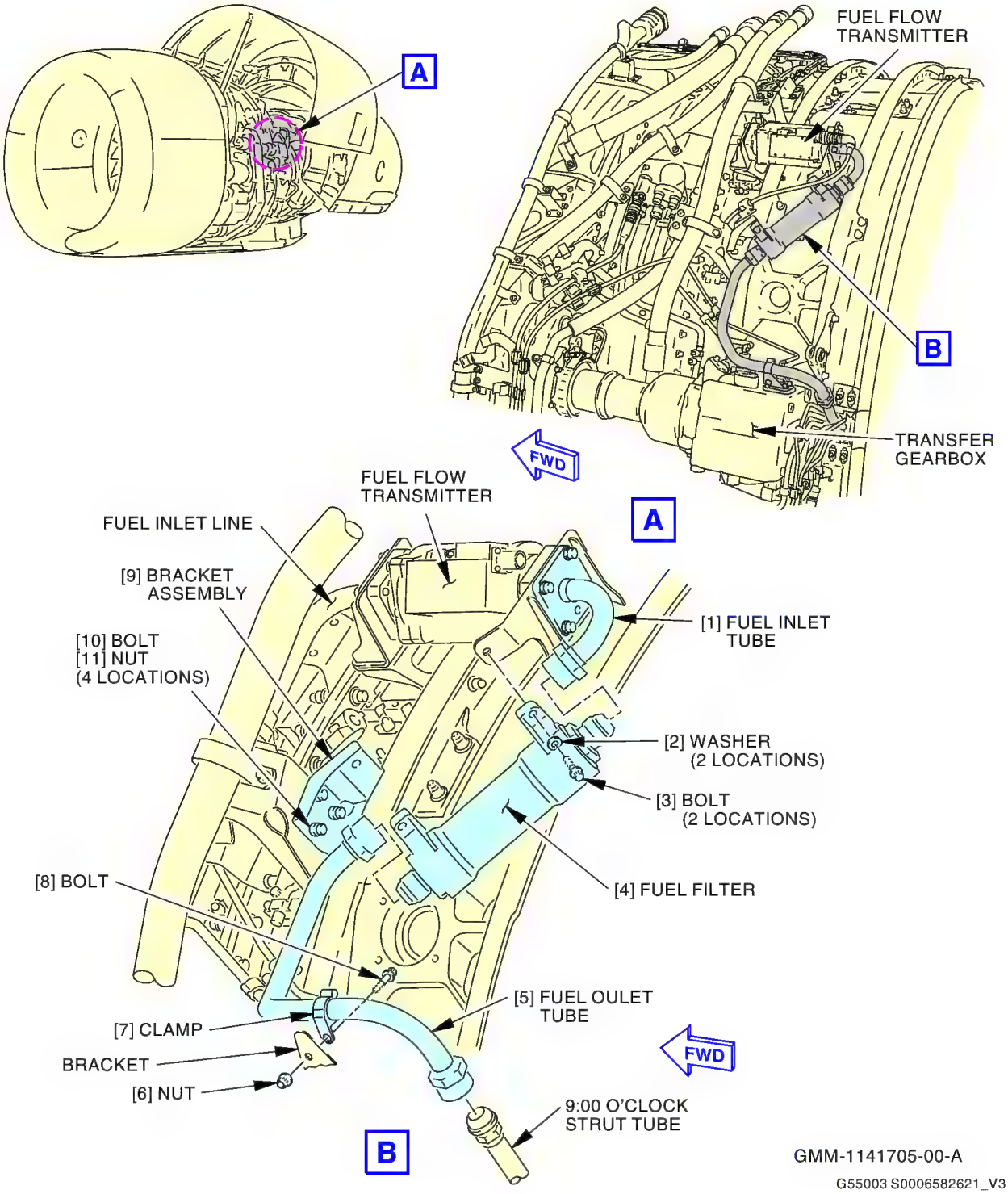
(b) Remove the two bolts [3] and washers [2] that hold the fuel nozzle filter [4] to the brackets.

1) Remove the fuel nozzle filter.

(c) Install protective covers on the fuel inlet tube [1], and the fuel nozzle filter [4].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Filter Installation (SAC)
Figure 401/73-11-03-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-03-400-802-F00

3. Fuel Nozzle Filter Installation (SAC)

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Fuel nozzle filter	73-11-03-01-045	IDC 001-006
		73-11-03-01A-065	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Procedure

SUBTASK 73-11-03-420-002-F00

(1) Connect the fuel nozzle filter [4] to the fuel inlet tube [1] and the bracket:

(a) Remove the protective covers from the fuel inlet tube [1] and the inlet of the fuel nozzle filter [4].

(b) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the two bolts [3].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(c) Use oil, D00623 [CP5066] to lubricate the inlet threads of the fuel nozzle filter [4].

(d) Loosen the four nuts [11] and bolts [10] that hold the bracket assembly [9].

(e) Loosen the four bolts that hold the fuel inlet tube [1] to the bracket and the fuel flow transmitter.

(f) Put the fuel nozzle filter [4] in its correct position on the engine.

(g) Use your hand to connect the fuel nozzle filter [4] to the fuel inlet tube [1].

(h) Use your hand to install the two bolts [3] and washers [2] that hold the fuel nozzle filter [4] to the brackets.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES (Continued)

SUBTASK 73-11-03-210-002-F00

(2) Make sure that the fuel nozzle filter [4] aligns correctly with the fuel inlet tube [1] and the brackets.

SUBTASK 73-11-03-420-008-F00

(3) Tighten these connections:

(a) Tighten the two bolts [3] to 97 in-lb (11 N·m) to 110 in-lb (12 N·m).

(b) Tighten the four bolts that hold the fuel inlet tube [1] to the bracket to 97 in-lb (11 N·m) to 110 in-lb (12 N·m).

(c) Tighten the four nuts [11] on the bolts [10] that hold the bracket assembly [9] to 98 in-lb (11 N·m) to 110 in-lb (12 N·m).

SUBTASK 73-11-03-420-003-F00

(4) Connect the fuel outlet tube [5] to the fuel nozzle filter [4]:

(a) Remove the protective covers from the fuel outlet tube [5], the 9:00 O'clock strut tube, and the outlet of the fuel nozzle filter [4].

(b) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the bolt [8].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(c) Use oil, D00623 [CP5066] to lubricate the outlet threads of the fuel nozzle filter [4].

(d) Use oil, D00623 [CP5066] to lubricate the threads of the 9:00 O'clock strut tube.

(e) Use your hand to connect the fuel outlet tube [5] to the fuel nozzle filter [4] and the 9:00 O'clock strut tube.

(f) Use the clamp [7], nut [6], and bolt [8] to connect the fuel outlet tube [5] to the bracket.

SUBTASK 73-11-03-210-001-F00

(5) Make sure that the fuel nozzle filter [4] aligns correctly with the fuel inlet tube [1], the fuel outlet tube [5], and the bracket.

SUBTASK 73-11-03-420-004-F00

(6) Tighten these connections:

CAUTION USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(a) Tighten the coupling nut between the fuel nozzle filter [4] and the fuel inlet tube [1] to 900 in-lb (102 N·m) to 1100 in-lb (124 N·m).

(b) Tighten the coupling nut between the fuel nozzle filter [4] and the fuel outlet tube [5] to 900 in-lb (102 N·m) to 1100 in-lb (124 N·m).

(c) Tighten the coupling nut between the fuel outlet tube [5] and the 9:00 O'clock strut tube to 900 in-lb (102 N·m) to 1100 in-lb (124 N·m).

(d) Tighten the nut [6] to 62 in-lb (7 N·m) to 71 in-lb (8 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES (Continued)

SUBTASK 73-11-03-840-007-F00

(7) Put the airplane in a serviceable condition:

(a) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(b) Remove the DO-NOT-OPERATE tag from the applicable start lever.

(c) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

SUBTASK 73-11-03-800-002-F00

(8) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

SUBTASK 73-11-03-720-001-F00



CAUTION

DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(9) If it is necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL NOZZLES/NO BSV INSTALLED - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the fuel nozzles, SAC engines with the no BSV installed.

(2) The installation of the fuel nozzles, SAC engines with the no BSV installed.

(3) SAC engines with the BSV removed the engine has only one fuel manifold. With the BSV installed the engines have two fuel manifolds, one going to every other fuel nozzle.

TASK 73-11-04-000-805-F01

2. Fuel Nozzle Removal

A. General

(1) The engine has twenty fuel nozzles.

(a) To remove the fuel nozzle from positions 1, 2, and 20, it is necessary to partially remove the bleed air precooler.

(b) To remove the nozzle from position 7, you must remove the LPT duct.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
36-11-04-000-801	PRSOV Removal (P/B 401)
36-12-01-800-801	Bleed Air Precooler Disconnection (For Engine Component Removal) (P/B 201)
72-00-00-200-805-F00	Combustion Section Borescope Inspection (P/B 601)
73-21-07-000-801-F00	T3 Sensor Removal (P/B 401)
75-21-01-000-801-F00	HPTACC Valve Removal (P/B 401)
75-22-04-000-802-F00	LPTACC Valve Removal (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-11-04-840-013-F01

(1) Make sure that the engine fuel valves are closed:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure the start levers are in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable start lever.

(c) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-840-015-F00

(2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 73-11-04-860-008-F00

(3) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

SUBTASK 73-11-04-010-003-F00

WARNING DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Fuel Nozzle Removal

SUBTASK 73-11-04-020-049-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do these steps to remove the fuel nozzle [24] from position 1 (Figure 401, Figure 402, Figure 403):

(a) Do this task: Bleed Air Precooler Disconnection (For Engine Component Removal), TASK 36-12-01-800-801.

(b) Do the applicable steps in the T3 Sensor removal task to disconnect the T3 line from the combustion case and from the support bracket (TASK 73-21-07-000-801-F00).

NOTE: Access to the fuel nozzle is easier when the T3 line is disconnected from the combustion case and the support bracket.

1) Carefully move the T3 line out of the way.

(c) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(d) Disconnect the coupling nut [25] from the fuel nozzle [24].

(e) Remove the bolt [44] that holds the loop clamp [43] to the support bracket [42].

(f) Remove the three bolts [23] and [41] from the fuel nozzle flange.

1) Remove the support bracket [42].

(g) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(i) Remove and discard the preformed packing [22] from the fuel nozzle [24].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(j) Remove and discard the preformed packing [26] from the fuel manifold [21].

(k) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-050-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do these steps to remove the fuel nozzle from position 2 (Figure 401, Figure 402, Figure 404):

(a) Do this task: Bleed Air Precooler Disconnection (For Engine Component Removal), TASK 36-12-01-800-801.

(b) Do the applicable steps in the T3 Sensor removal task to disconnect the T3 line from the combustion case and from the support bracket (TASK 73-21-07-000-801-F00).

NOTE: Access to the fuel nozzle is easier when the T3 line is disconnected from the combustion case and the support bracket.

1) Carefully move the T3 line out of the way.

(c) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(d) Disconnect the coupling nut [25] from the fuel nozzle [24].

(e) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(f) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(g) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(i) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(j) Remove and discard the preformed packing [26] from the fuel manifold [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(k) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-051-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do these steps to remove the fuel nozzle from position 3 (Figure 401, Figure 402, Figure 405):

(a) Disconnect the LPT cooling air tube.

NOTE: Access to the fuel nozzle is easier when the LPT cooling air tube is disconnected.

(b) Install protective covers on the LPT cooling air tube, combustion case and compressor case.

(c) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(d) Disconnect the coupling nut [25] from the fuel nozzle [24].

(e) Remove the bolt [23] and two bolts [41] from the flange of the fuel nozzle.

(f) Loosen the bolts [82] on the tube bracket [81].

NOTE: Tube bracket is installed on airplanes with PRE SB 72-0695.

1) Move the tube bracket [81] away from the fuel nozzle.

(g) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(i) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(j) Remove and discard the preformed packing [26] from the fuel manifold [21].

(k) Visually examine the fuel nozzle wear sleeves.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-061-F00

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Do these steps to remove the fuel nozzle from position 4 (Figure 401, Figure 402, Figure 404):

(a) Do the applicable steps in the HPTACC Valve Removal Task to disconnect the 9th stage inlet tube from the combustion case and the HPTACC Valve (TASK 73-21-07-000-801-F00).

NOTE: Access to the fuel nozzle is easier when the 9th stage inlet tube is disconnected from the combustion case and HPTACC valve.

1) Remove the two bolts on the EGT harness and carefully move the EGT harness out of the way.

2) Make sure that you install protective covers on the 9th stage inlet tube and the HPTACC valve.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(e) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-052-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(5) Do these steps to remove the fuel nozzle from position 5 (Figure 401, Figure 402, Figure 406):

(a) Do the applicable steps in the HPTACC Valve Removal Task to disconnect the 9th stage inlet tube from the combustion case and the HPTACC valve (TASK 75-21-01-000-801-F00).

NOTE: Access to the fuel nozzle is easier when the 9th stage inlet tube is disconnected from the combustion case and the HPTACC valve.

1) Remove the two bolts on the EGT harness and carefully move the EGT harness out of the way.

2) Make sure that you install protective covers on the 9th stage inlet tube and the HPTACC valve.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(e) Remove the nut [104] and bolt [102] that hold the loop clamp [101] to the bracket [103].

1) Remove the bracket [103].

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-062-F00

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(6) Do these steps to remove the fuel nozzle from positions 6 (Figure 401, Figure 402, Figure 404):

(a) Do the applicable steps in the HPTACC Valve Removal Task to disconnect the TCC manifold (TASK 75-21-01-000-801-F00).

NOTE: Access to the fuel nozzle is easier when the TCC manifold is disconnected.

Make sure that you install protective covers on the TCC manifold and the HPTACC valve.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(e) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-053-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do these steps to remove the fuel nozzle from position 7 (Figure 401, Figure 402, Figure 407):

(a) Do the applicable steps in the LPTACC Valve Removal task to remove the LPT duct (TASK 75-22-04-000-802-F00).

NOTE: You must remove the LPT duct to get access to the number 7 fuel nozzle.

1) Make sure that you install protective covers on the LPT duct, the LPT manifold, and the LPTACC valve.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] of the fuel manifold [21] from the fuel nozzle [24].

(d) Remove the bolts [143] that hold the loop clamps [142] to the support bracket [141].

(e) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

1) Remove the support bracket [141].

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

(j) Visually examine the fuel nozzle wear sleeves.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-054-F01

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Do these steps to remove the fuel nozzle from position 8 (Figure 401, Figure 402, Figure 408):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolts [163] that holds the strap clamp [162] to the cooling tube bracket [161].

1) Remove the strap clamp [162].

(d) Remove the three bolts [41] from the flange of the fuel nozzle.

1) Remove the cooling tube bracket [161].

(e) Move the hinged bracket [164] away from the fuel nozzle.

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-055-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(9) Do these steps to remove the fuel nozzle from position 9 (Figure 401, Figure 402, Figure 409):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolt [182] that holds the loop clamp [181] to the igniter cable bracket [183A].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

1) Remove the igniter cable bracket [183A].

(e) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(g) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(h) Remove and discard the preformed packing [26] from the fuel manifold [21].

(i) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-063-F00

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(10) Do these steps to remove the fuel nozzle from position 10 (Figure 401, Figure 402, Figure 404):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(d) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(e) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(g) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(h) Remove and discard the preformed packing [26] from the fuel manifold [21].

(i) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-020-056-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(11) Do these steps to remove the fuel nozzle from position 11 (Figure 401, Figure 402, Figure 410):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] from the flange of the fuel nozzle.

1) Remove the support bracket [203].

(d) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(e) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(f) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(g) Remove and discard the preformed packing [26] from the fuel manifold [21].

(h) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(i) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-057-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(12) Do these steps to remove the fuel nozzle from position 12 (Figure 401, Figure 402, Figure 411):

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Disconnect the shroud [27] from the fuel nozzle [24].
   1) Move the shroud [27] to get access the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the nut [224] and bolt [221] that hold the loop clamps [222] and [223] to the support bracket [228].

(d) Remove the bolt [226] that holds the loop clamp [225] to the support bracket [228].

(e) Remove the three bolts [41] and [227] from the flange of the fuel nozzle.
   1) Remove the support bracket [228].

(f) Move the hinged bracket [229] away from the fuel nozzle.

(g) Do these steps to remove the fuel nozzle from the combustion case:
   1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.
   2) Remove the fuel nozzle.

      NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.
   1) Discard the seal [28].

(i) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(j) Remove and discard the preformed packing [26] from the fuel manifold [21].

(k) Visually examine the fuel nozzle wear sleeves.
   1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

      NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

      a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

         <1> If you cannot do the borescope inspection, continue-in-service for five cycles.

   2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

      NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

      a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-058-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(13) Do these steps to remove the fuel nozzle from position 13 (Figure 401, Figure 402, Figure 412):

(a) Disconnect the shroud [27] from the fuel nozzle [24].
   1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] from the flange of the fuel nozzle.

(d) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(e) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(f) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(g) Remove and discard the preformed packing [26] from the fuel manifold [21].

(h) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(i) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-064-F00



WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(14) Do these steps to remove the fuel nozzle from position 14 (Figure 401, Figure 402, Figure 404):

NOTE: Access to the fuel nozzle is easier when the transient bleed air tube is removed.

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(d) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(e) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(g) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(h) Remove and discard the preformed packing [26] from the fuel manifold [21].

(i) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-059-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(15) Do these steps to remove the fuel nozzle from position 15 (Figure 401, Figure 402, Figure 413):

NOTE: Access to the fuel nozzle is easier when the 9th stage air manifold and igniter are removed.

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolt [209] that holds the loop clamp [207] to the support bracket [205].

(d) Remove the three bolts [23] and [41] from the fuel nozzle flange.

1) Remove the support bracket [205].

(e) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(g) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(h) Remove and discard the preformed packing [26] from the fuel manifold [21].

(i) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-065-F00

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(16) Do these steps to remove the fuel nozzle from position 16 (Figure 401, Figure 402, Figure 404):

(a) Disconnect the PS3 line from the combustion case and from the two PS3 brackets closest to the combustion case.

NOTE: Access to the fuel nozzle is easier when the PS3 line is disconnected.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(e) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-066-F00

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(17) Do these steps to remove the fuel nozzle from position 17 (Figure 401, Figure 402, Figure 412):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] from the flange of the fuel nozzle.

(d) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(e) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(f) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(g) Remove and discard the preformed packing [26] from the fuel manifold [21].

(h) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(i) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-060-F01

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(18) Do these steps to remove the fuel nozzle from position 18 (Figure 401, Figure 402, Figure 414):

(a) Do the applicable steps in the PRSOV task to turn the PRSOV body out of the way (TASK 36-11-04-000-801).

NOTE: Access to the fuel nozzle is easier when the PRSOV body is out of the way.

1) Disconnect the two B-nuts of the PRSOV.

2) Loosen the two clamps on the valve tube

3) Move the PRSOV body out of the way.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the bolt [264] that holds the loop clamp [265] to the cooling tube bracket [261].

(e) Remove the two bolts [262] that hold the cooling tube bracket [261] to the hinged bracket [263].

1) Remove the cooling tube bracket [261].

(f) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(g) Move the hinged bracket [263] away from the fuel nozzle.

(h) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(i) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(j) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(k) Remove and discard the preformed packing [26] from the fuel manifold [21].

(l) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(m) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-067-F00

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(19) Do these steps to remove the fuel nozzle [24] from position 19 (Figure 401, Figure 402, Figure 403):

(a) Disconnect the LPT cooling air tube.

NOTE: Access to the fuel nozzle is easier when the LPT cooling air tube is disconnected.

(b) Install protective covers on the LPT cooling air tube, combustion case and compressor case.

(c) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(d) Disconnect the coupling nut [25] from the fuel nozzle [24].

(e) Remove the bolt [44] that holds the loop clamp [43] to the support bracket [42].

(f) Remove the three bolts [23] and [41] from the fuel nozzle flange.

1) Remove the support bracket [42].

(g) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(i) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(j) Remove and discard the preformed packing [26] from the fuel manifold [21].

(k) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-068-F00

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(20) Do these steps to remove the fuel nozzle from position 20 (Figure 401, Figure 402, Figure 404):

(a) Do this task: Bleed Air Precooler Disconnection (For Engine Component Removal), TASK 36-12-01-800-801.

(b) Disconnect the LPT cooling air tube.

NOTE: Access to the fuel nozzle is easier when the LPT cooling air tube is disconnected.

(c) Install protective covers on the LPT cooling air tube, combustion case and compressor case.

(d) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(e) Disconnect the coupling nut [25] from the fuel nozzle [24].

(f) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(g) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(h) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(i) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Discard the seal [28].

(j) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(k) Remove and discard the preformed packing [26] from the fuel manifold [21].

(l) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, replace the fuel nozzles and do this step:

NOTE: Fuel nozzles with wear sleeves that are dislodged are not serviceable.

a) Do a borescope inspection of the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

<1> If you cannot do the borescope inspection, continue-in-service for five cycles.

2) If the wear sleeves have four interrupted weld design, replace the fuel nozzle:

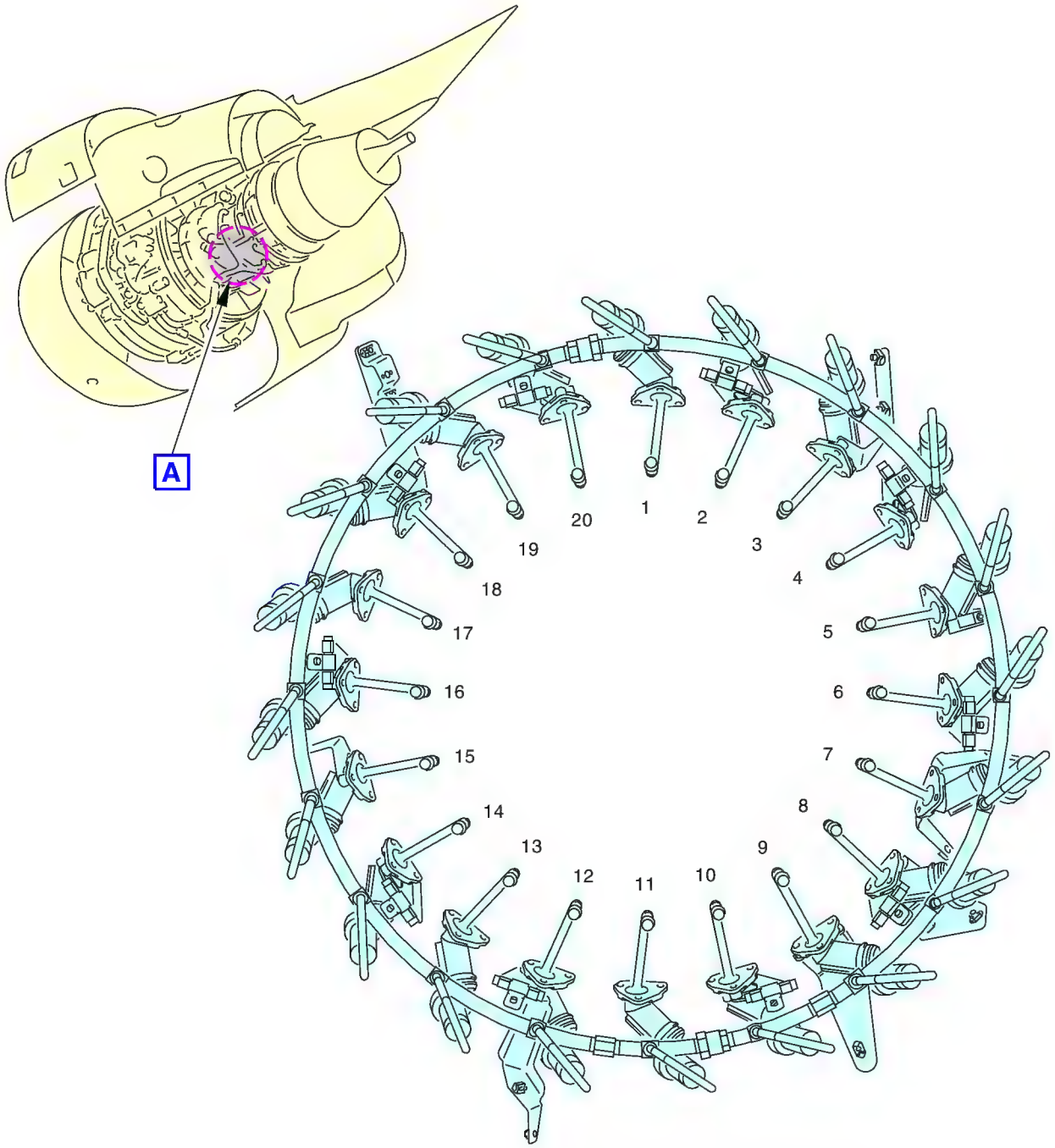
NOTE: Fuel nozzles that have four interrupted weld design are not serviceable.

a) If you do not replace the fuel nozzle, continue-in-service for five cycles.

(m) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

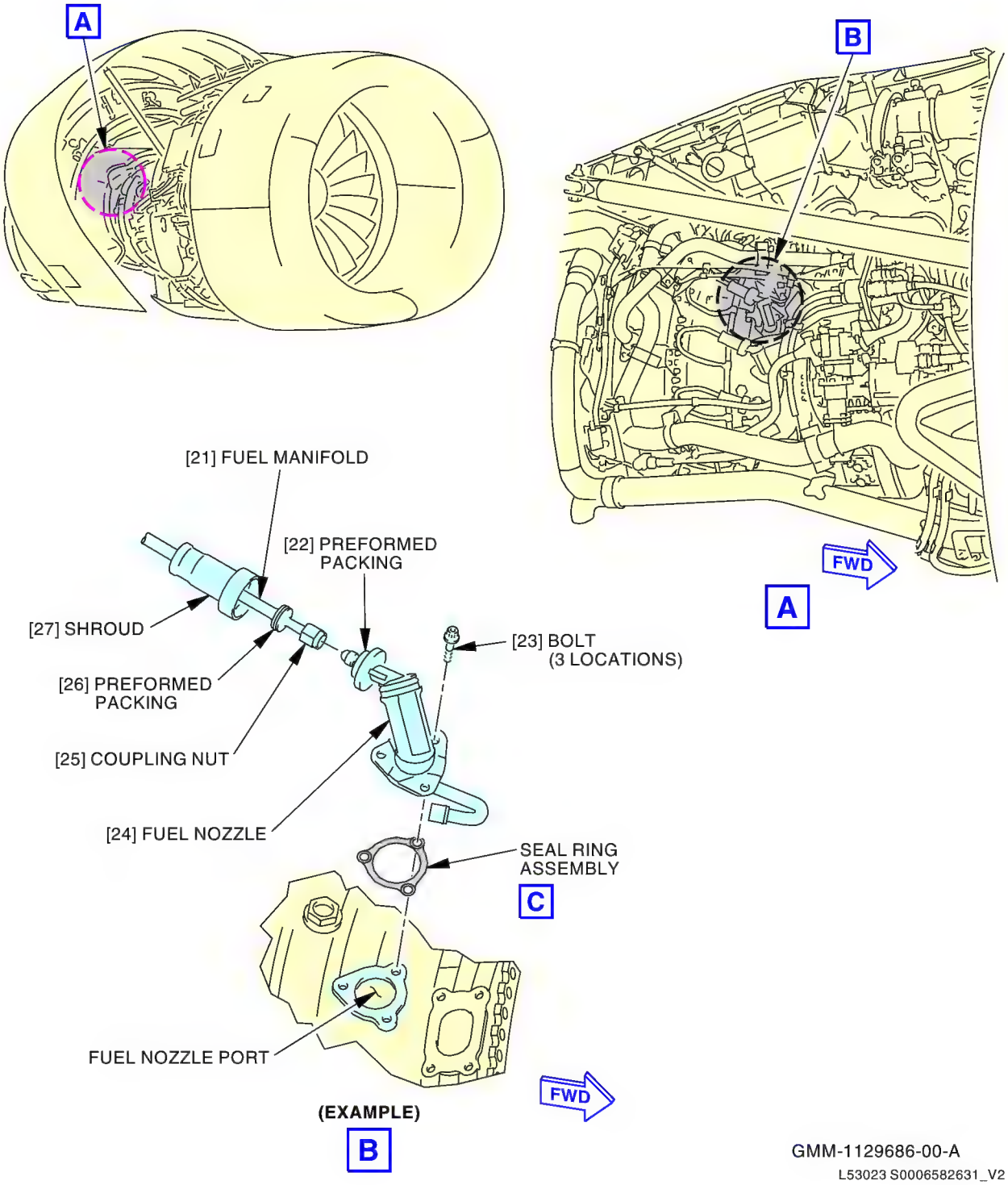
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



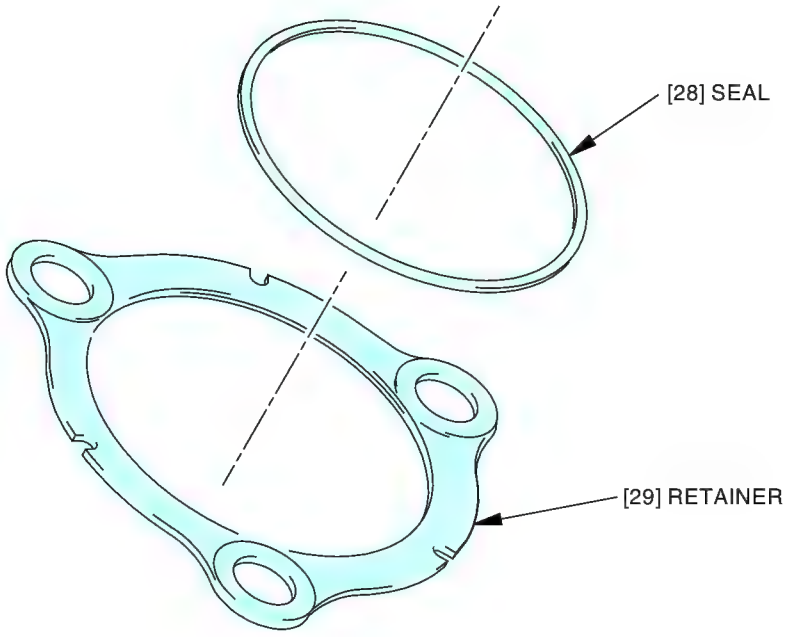
Fuel Nozzle Location
Figure 401/73-11-04-990-857-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Installation
Figure 402/73-11-04-990-858-F01 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



SEAL RING ASSEMBLY (EXAMPLE)

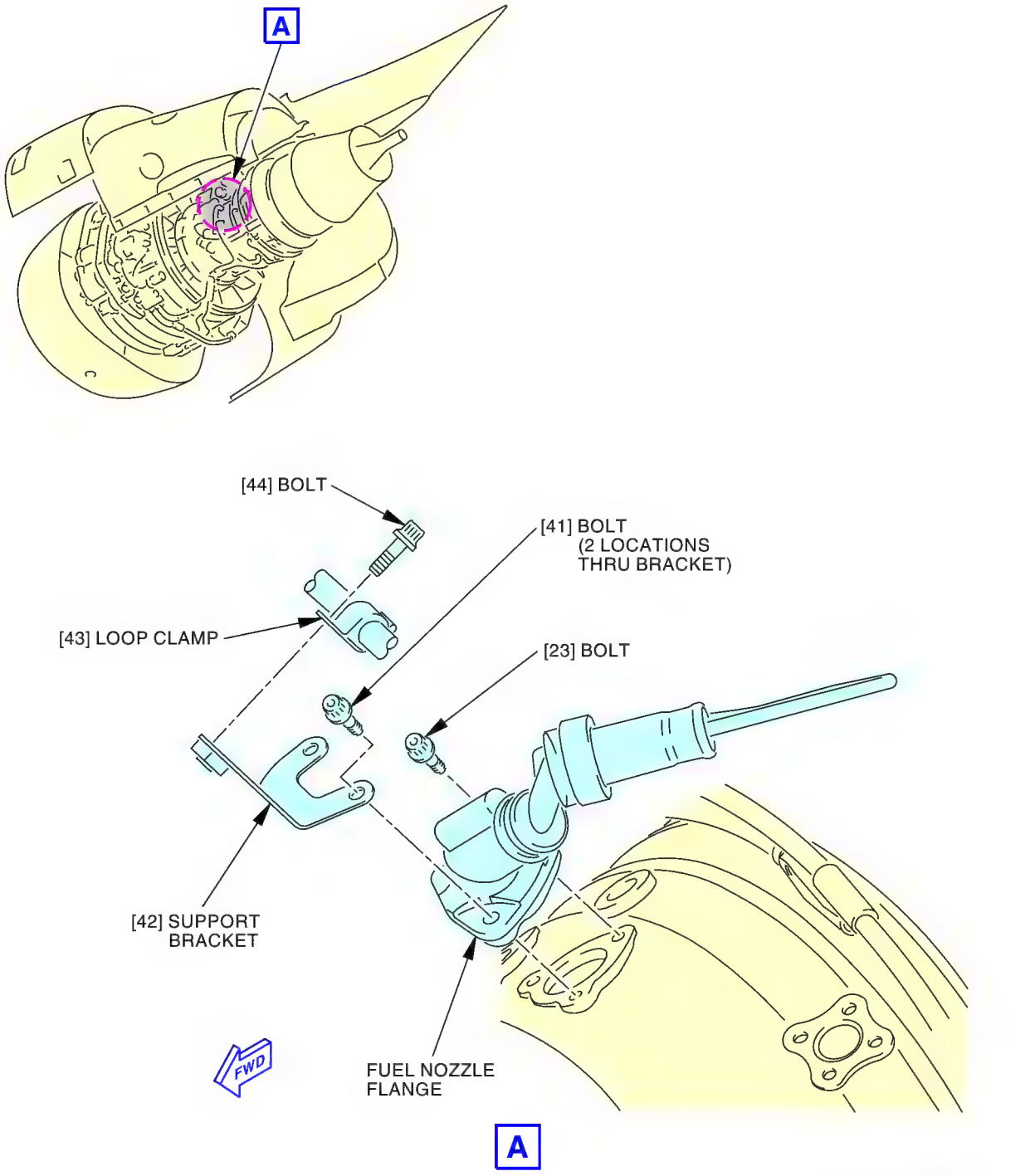
C

GMM-1129687-00-A

L53028 S0006582632_V2

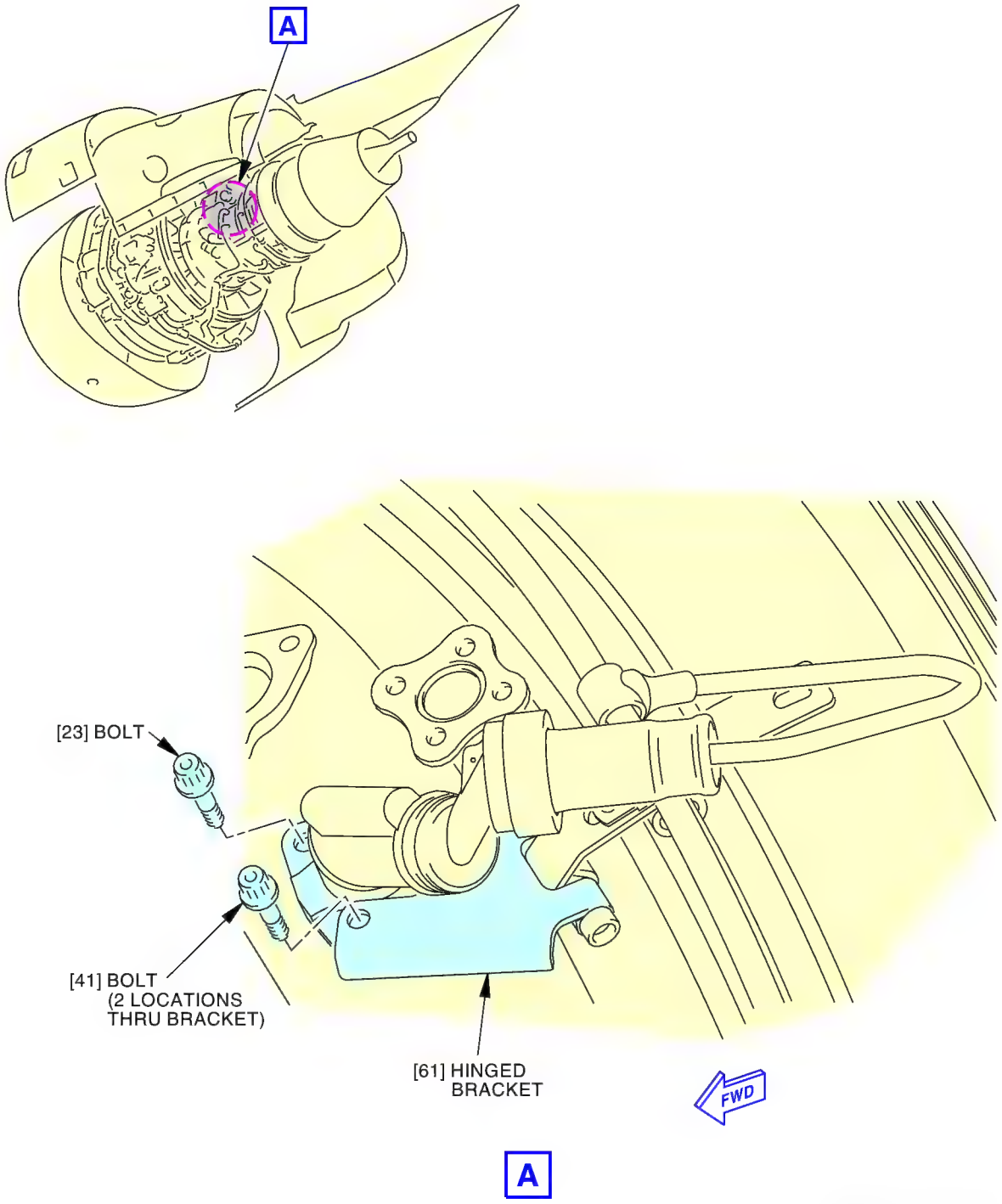
Fuel Nozzle Installation
Figure 402/73-11-04-990-858-F01 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



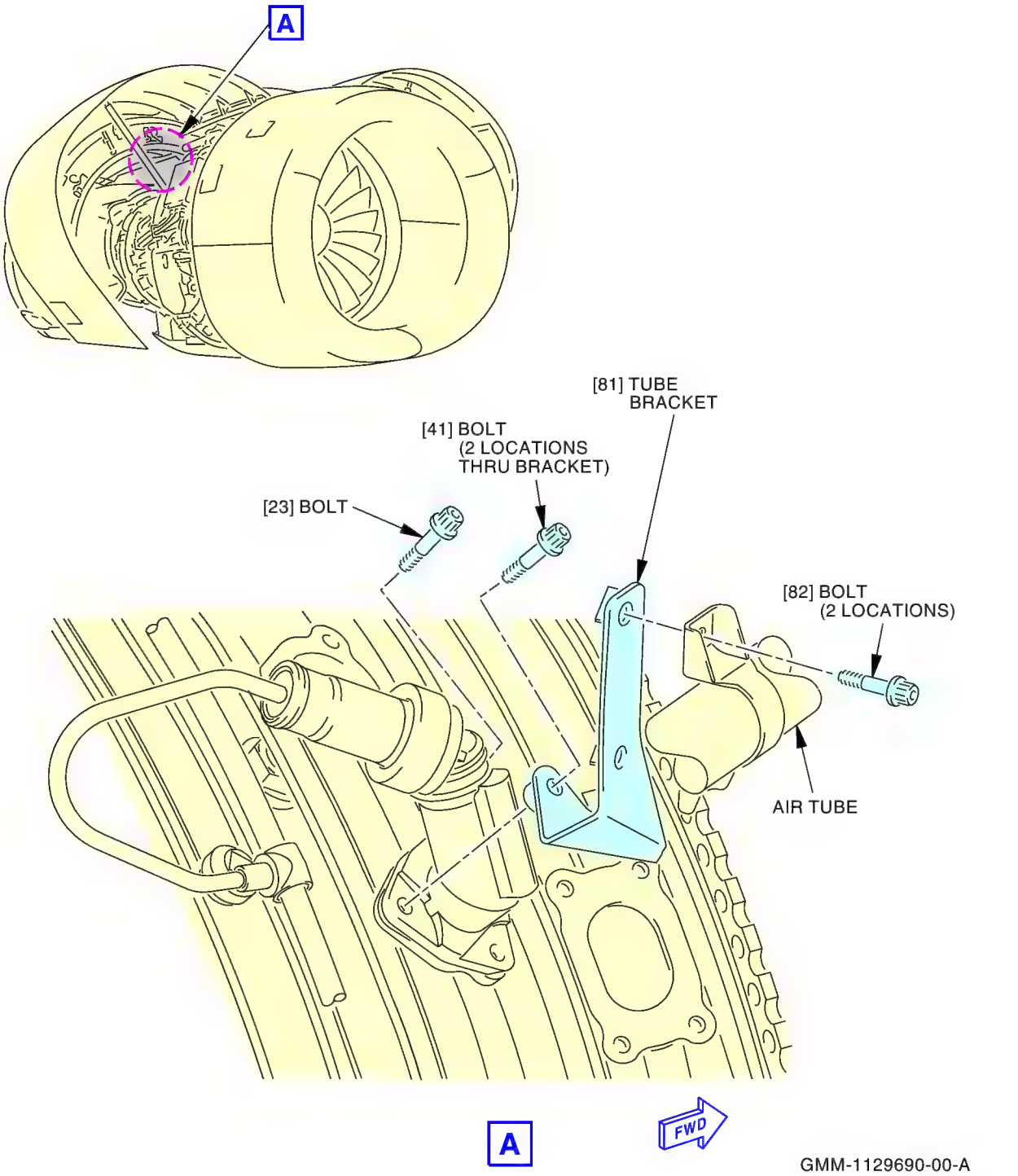
Fuel Nozzle Position 1 and 19 Installation
Figure 403/73-11-04-990-859-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



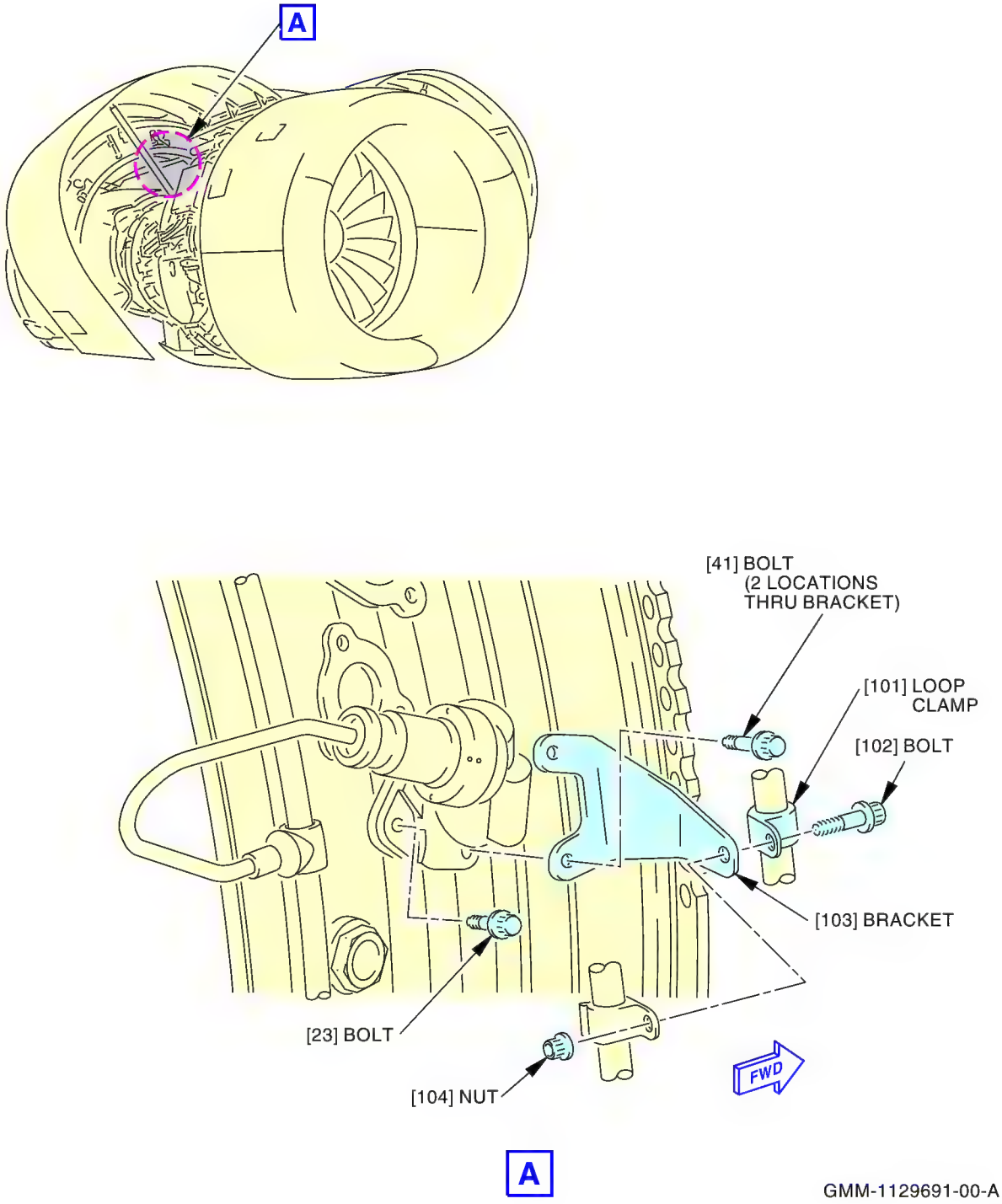
Fuel Nozzle Position 2, 4, 6, 10, 14, 16 and 20 Installation
Figure 404/73-11-04-990-860-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



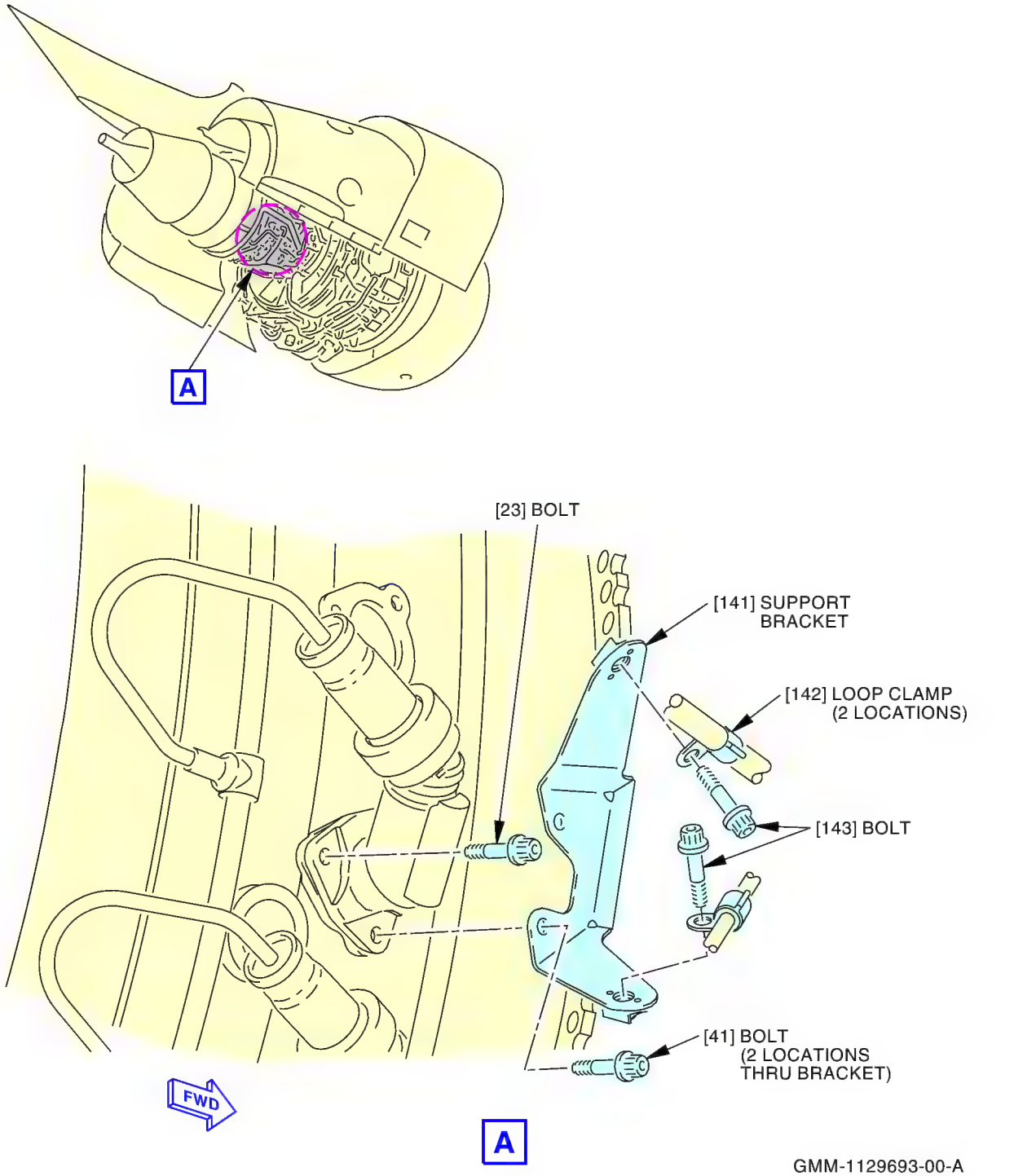
Fuel Nozzle Position 3 Installation
Figure 405/73-11-04-990-861-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



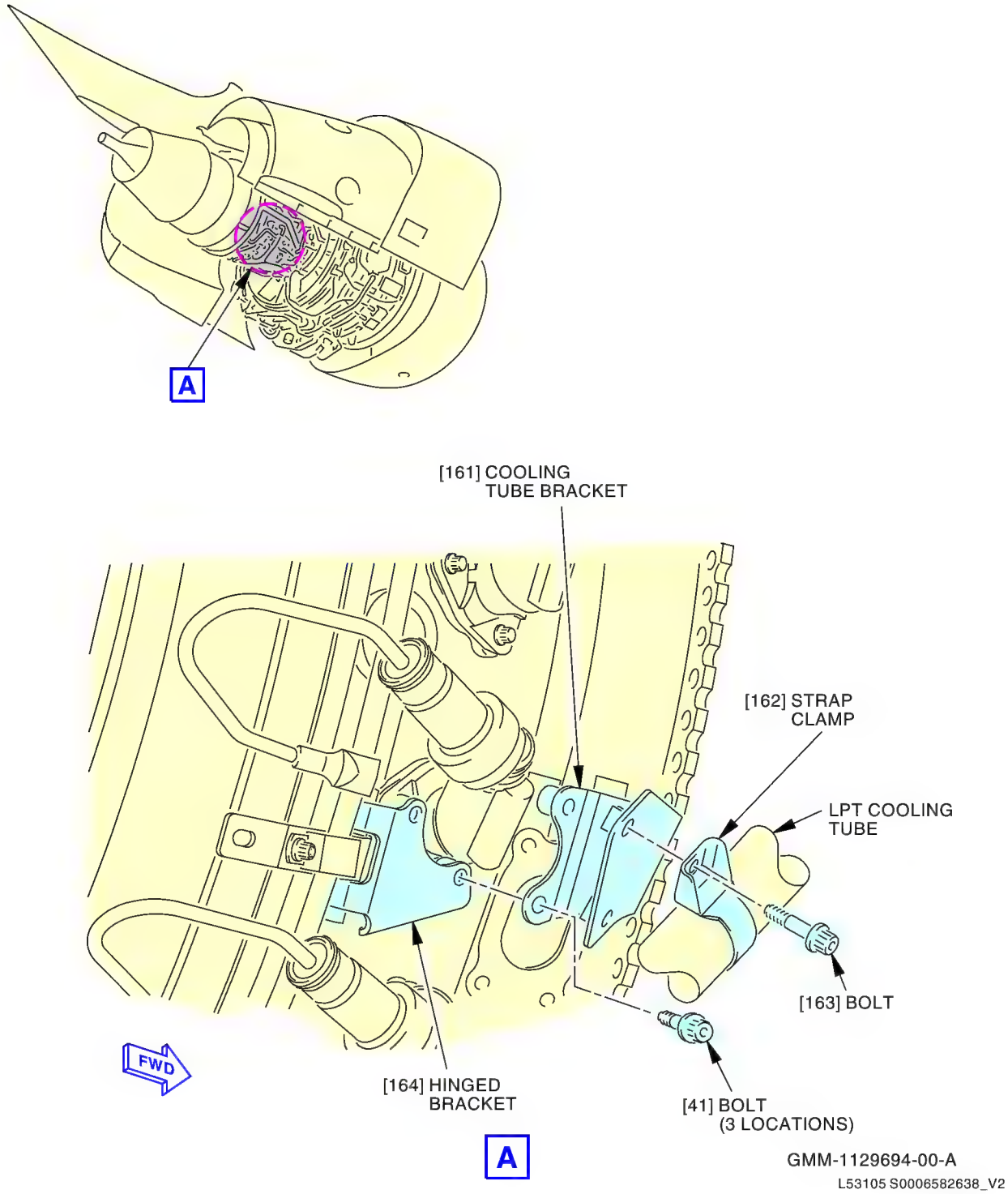
Fuel Nozzle Position 5 Installation
Figure 406/73-11-04-990-862-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



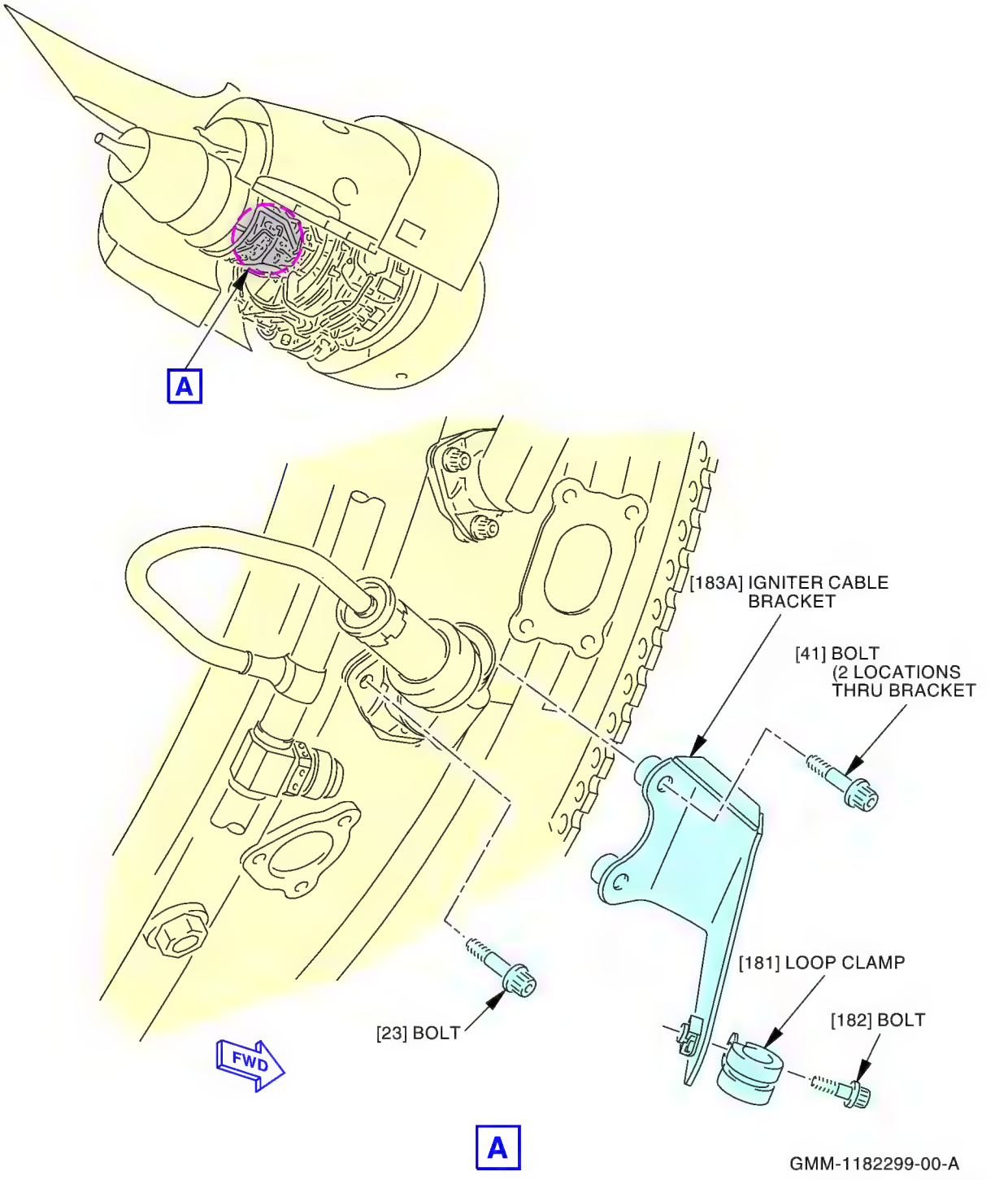
Fuel Nozzle Position 7 Installation
Figure 407/73-11-04-990-863-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



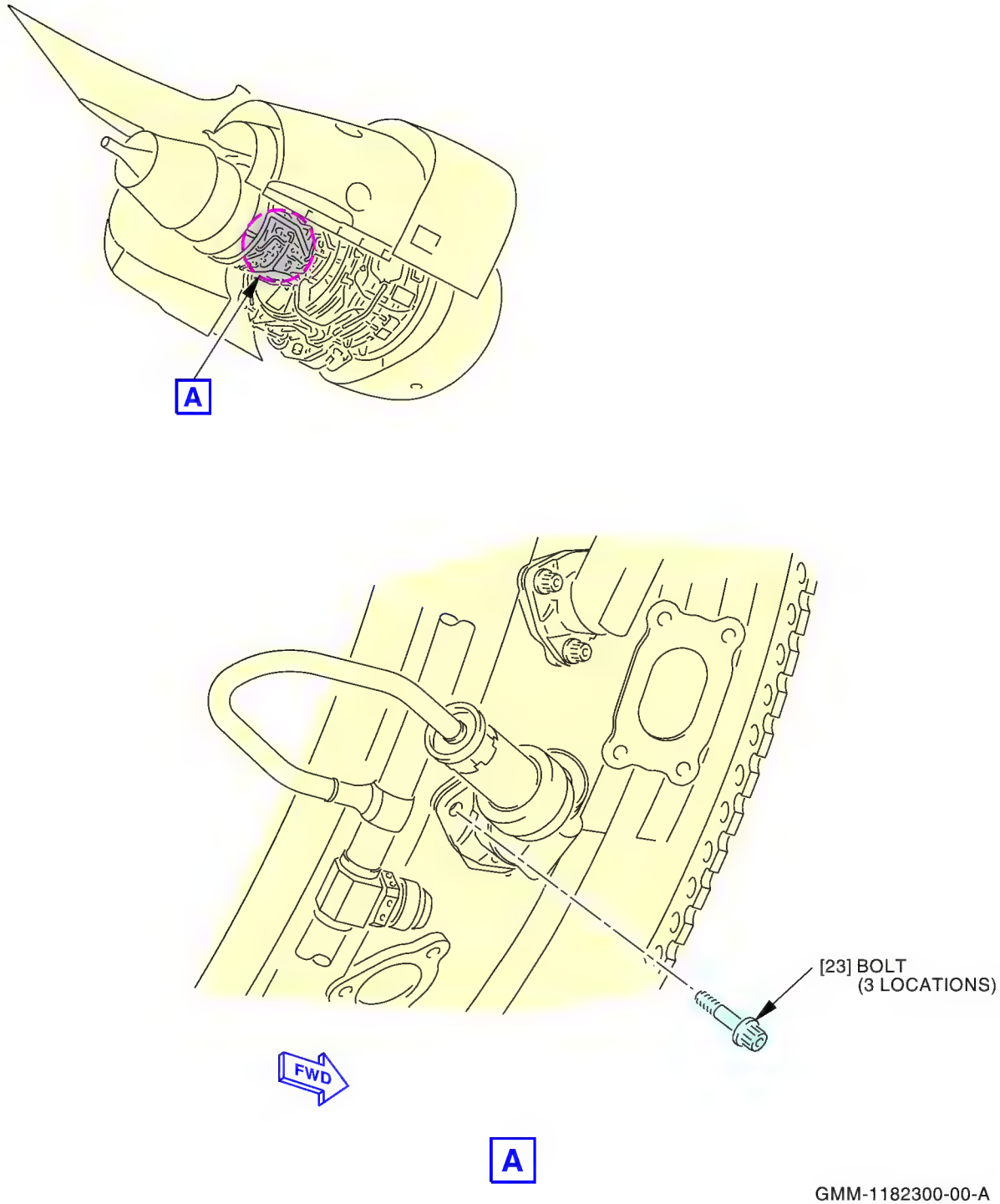
Fuel Nozzle Position 8 Installation
Figure 408/73-11-04-990-864-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



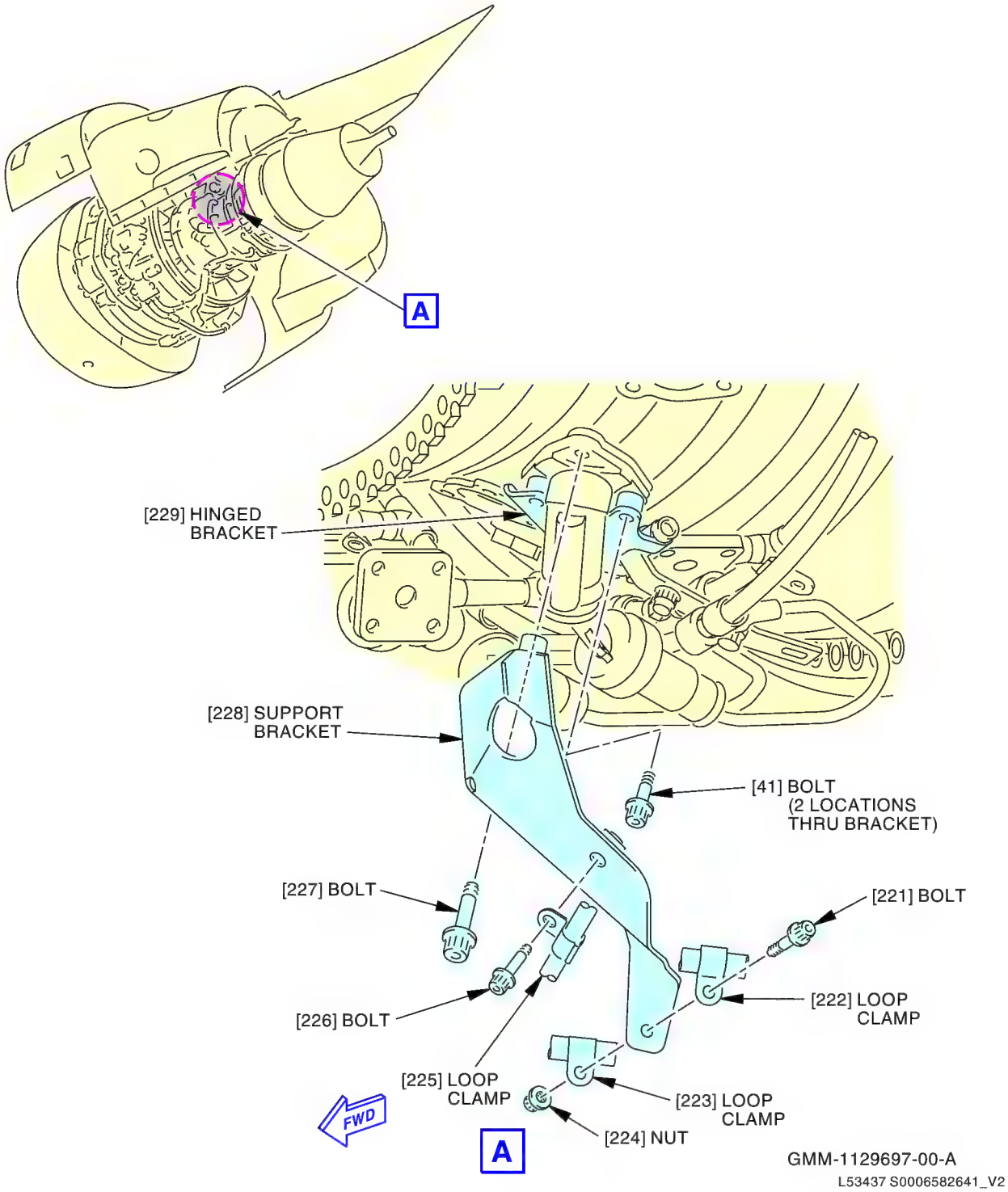
Fuel Nozzle Position 9 Installation
Figure 409/73-11-04-990-865-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



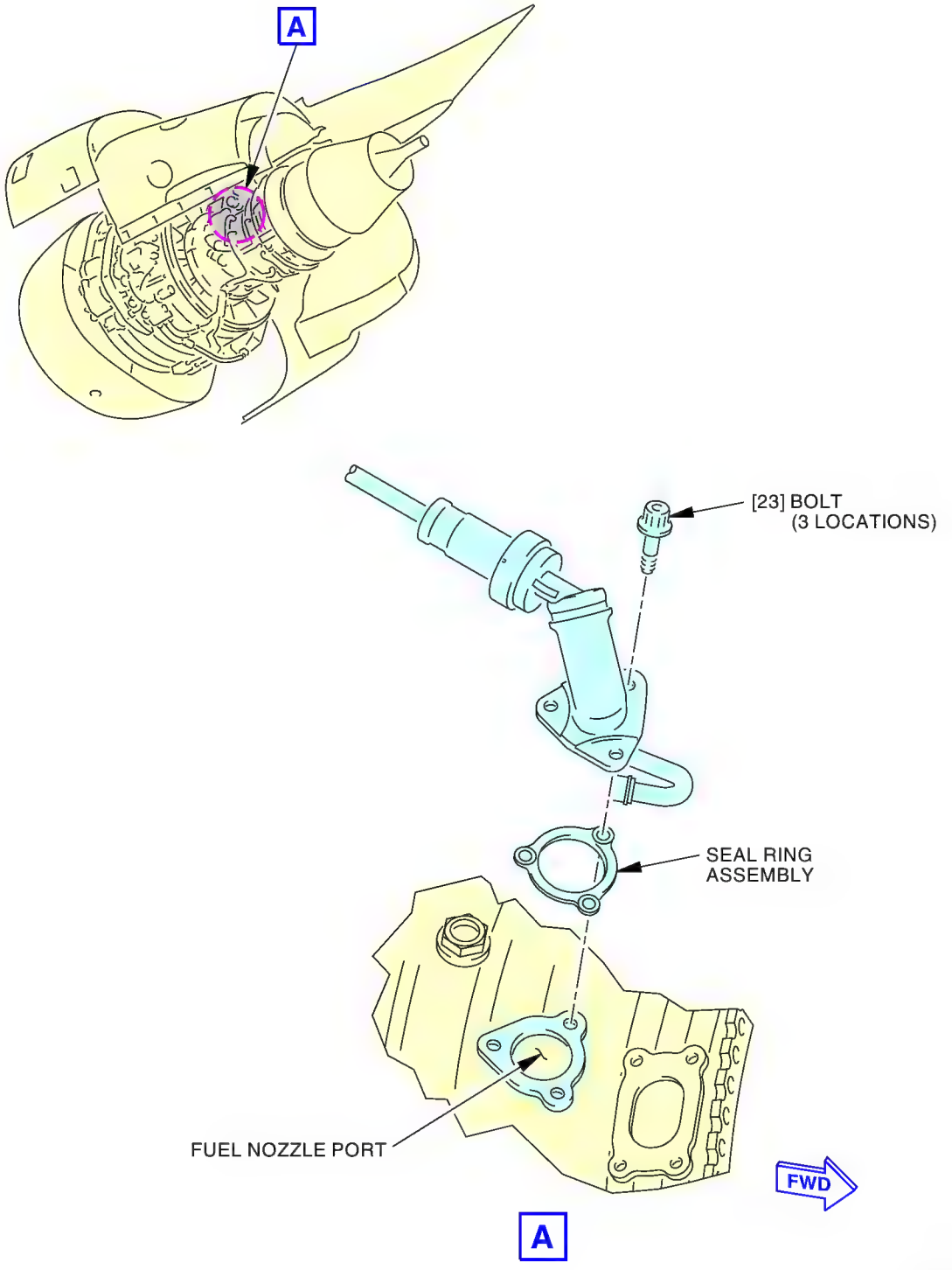
Fuel Nozzle Position 11 Installation
Figure 410/73-11-04-990-866-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



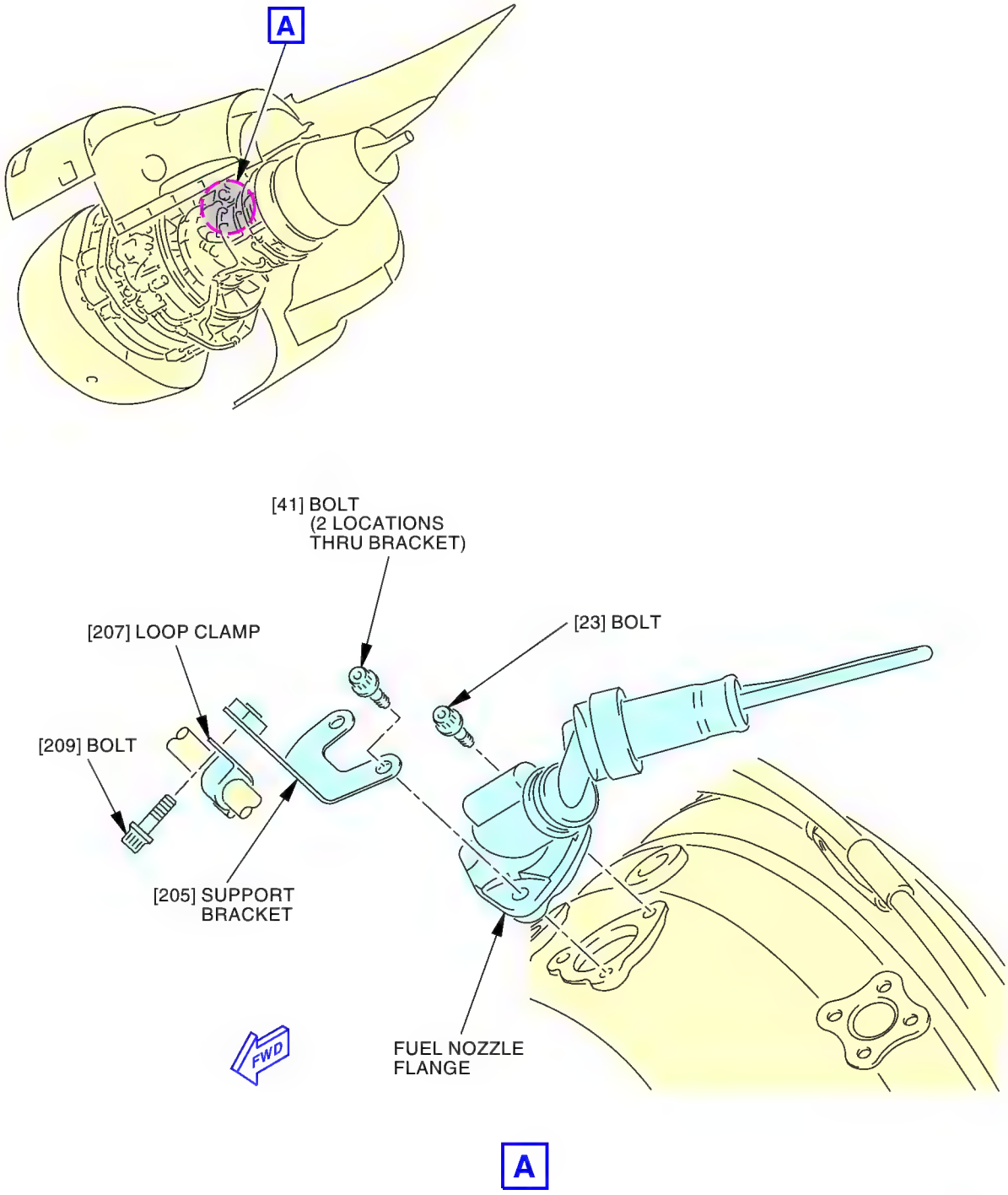
Fuel Nozzle Position 12 Installation
Figure 411/73-11-04-990-867-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Position 13 and 17 Installation
Figure 412/73-11-04-990-868-F01

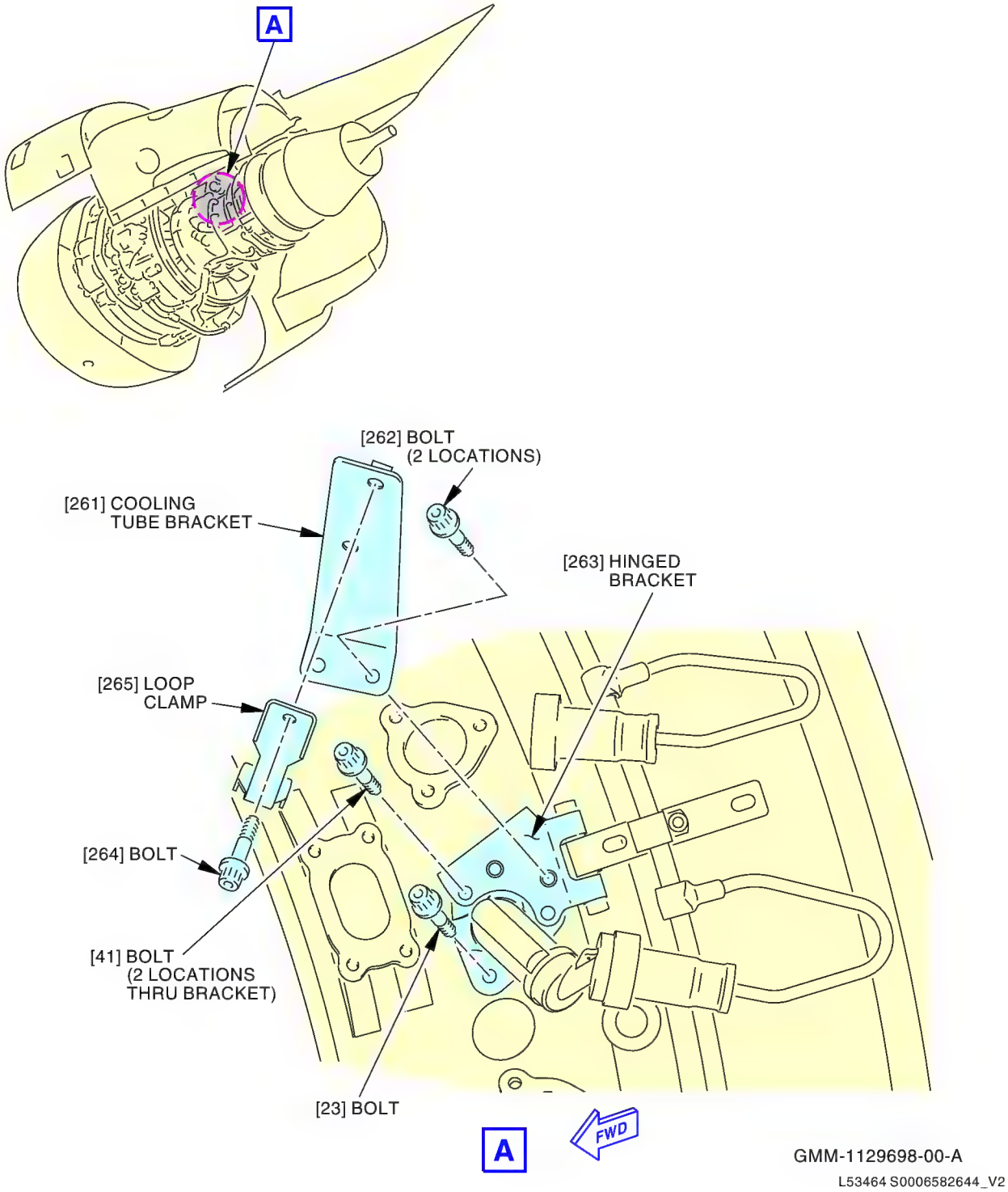
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



L53452 S0006582643_V2

Fuel Nozzle Position 15 Installation
Figure 413/73-11-04-990-869-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Position 18 Installation
Figure 414/73-11-04-990-870-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-04-400-805-F01

3. Fuel Nozzle Installation

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-11-04-400-801	PRSOV Installation (P/B 401)
36-12-01-400-801	Bleed Air Precooler Reconnection (After Engine Component Installation) (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-11-04-200-801-F00	Fuel Nozzle and Fuel Manifold Leak Check (P/B 601)
73-21-07-400-801-F00	T3 Sensor Installation (P/B 401)
75-21-01-400-801-F00	HPTACC Valve Installation (P/B 401)
75-22-04-400-802-F00	LPTACC Valve Installation (P/B 401)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G02495 [CP8002]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8002, AMS5689
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Preformed packing	73-11-04-01-120	IDC 001-006
		73-11-04-04-110	IDC 001-010, 012-999
24	Fuel nozzle	73-11-04-01-085	IDC 001-006
		73-11-04-01-090	IDC 001-006
		73-11-04-04-085	IDC 001-010, 012-999
		73-11-04-04-090	IDC 001-010, 012-999
26	Preformed packing	73-11-04-01-115	IDC 001-006
		73-11-04-04-105	IDC 001-010, 012-999
28	Seal	73-11-04-01-110	IDC 001-006
		73-11-04-04-100	IDC 001-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Fuel Nozzle Installation

SUBTASK 73-11-04-420-049-F01

(1) Do these steps to install the fuel nozzle at position 1 (Figure 401, Figure 402, Figure 403):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Put the support bracket [42] in its correct position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Install the bolt [44] that holds the loop clamp [43] to the support bracket [42].

1) Tighten the bolt [44] to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Do the applicable steps in the T3 Sensor Installation task to re-connect the T3 line to the combustion case and to the support bracket (TASK 73-21-07-400-801-F00).

(k) Do this task: Bleed Air Precooler Reconnection (After Engine Component Installation), TASK 36-12-01-400-801.

SUBTASK 73-11-04-420-050-F01

(2) Do these steps to install the fuel nozzle at position 2 (Figure 401, Figure 402, Figure 404):

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) Do the applicable steps in the T3 Sensor Installation task to re-connect the T3 line to the combustion case and to the support bracket (TASK 73-21-07-400-801-F00).

(j) Do this task: Bleed Air Precooler Reconnection (After Engine Component Installation), TASK 36-12-01-400-801.

SUBTASK 73-11-04-420-051-F01

(3) Do these steps to install the fuel nozzle at position 3 (Figure 401, Figure 402, Figure 405):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101], or Never-Seez NSBT compound, D00006, to the threads of the bolt [23] and bolts [41].

(f) Move the tube bracket [81] into its position on the fuel nozzle flange.

NOTE: Tube bracket is installed on airplanes with PRE SB 72-0695.

(g) Install the bolt [23] and bolts [41] in the fuel nozzle flange.

1) Tighten the bolt [23] and bolts [41] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).

2) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the bolt [23] and bolts [41].

(h) Install the bolts [82] that attach the air tube to the tube bracket [81].

NOTE: Tube bracket is installed on airplanes with PRE SB 72-0695.

1) Tighten the bolts [82] to 62 in-lb (7 N·m) - 68 in-lb (7.7 N·m).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Reconnect the LPT cooling air tube to the combustion case and compressor case as follows:

1) Make sure that the metal ring seal is in place.

2) Apply graphite mineral vaseline, D00601 [CP2101] to the bolts

3) Tighten the bolts to 62-68 lb in. (7.0-7.7 N.m) and safety with safety wire, G02345 [CP8001] or safety wire, G02495 [CP8002].

SUBTASK 73-11-04-420-061-F00

(4) Do these steps to install the fuel nozzle at position 4 (Figure 401, Figure 402, Figure 404):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].
2) Install the preformed packing [22] on the fuel nozzle [24].
3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) Do the applicable steps in the HPTACC Valve installation task to re-connect the 9th stage inlet tube to the combustion case and the HPTACC valve (TASK 75-21-01-400-801-F00).

1) Install the two bolts on the EGT harness bracket.

SUBTASK 73-11-04-420-052-F01

(5) Do these steps to install the fuel nozzle at position 5 (Figure 401, Figure 402, Figure 406):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].
2) Install the preformed packing [22] on the fuel nozzle [24].
3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the bracket [103] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.
1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Use the bolt [102] and nut [104] to connect the loop clamp [101] to the bracket [103].
1) Tighten the nut [104] to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:
1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Do the applicable steps in the HPTACC Valve installation task to re-connect the 9th stage inlet tube to the combustion case and the HPTACC valve (TASK 75-21-01-400-801-F00).
1) Install the two bolts on the EGT harness bracket.

SUBTASK 73-11-04-420-062-F00

(6) Do these steps to install the fuel nozzle at position 6(Figure 401, Figure 402, Figure 404):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:
1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].
2) Install the preformed packing [22] on the fuel nozzle [24].
3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:
1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) Do the applicable steps in the HPTACC Valve installation task to re-connect the TCC Air Manifold (TASK 75-21-01-400-801-F00).

SUBTASK 73-11-04-420-053-F01

(7) Do these steps to attach the fuel nozzle at position No. 7 to the combustion case (Figure 401, Figure 402, Figure 407):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the support bracket [141] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [143].

(i) Install the bolts [143] to attach the loop clamps [142] to the support bracket [141].

1) Tighten the bolts [143] to 62-68 pound-inches (7.0-7.7 Newton meters).

(j) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(k) Do the applicable steps in the LPTACC Valve installation task to install the LPT duct (TASK 75-22-04-400-802-F00).

SUBTASK 73-11-04-420-054-F01

(8) Do these steps to install the fuel nozzle at position 8 (Figure 401, Figure 402, Figure 408):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [41].

(f) Move the hinged bracket [164] into its position on the fuel nozzle flange.

(g) Put the cooling tube bracket [161] on the fuel nozzle flange and hinged bracket [164].

(h) Install the bolts [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(i) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolt [163].

(j) Put the strap clamp [162] on the LPT cooling tube.

(k) Use the bolts [163] to connect the strap clamp [162] to the cooling tube bracket [161].

1) Tighten the bolts to 62-68 pound-inches (7.0-7.7 Newton meters).

(l) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-055-F01

(9) Do these steps to install the fuel nozzle at position 9 (Figure 401, Figure 402, Figure 409):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the igniter cable bracket [183A] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolt [182].

(i) Use the bolt [182] to connect the loop clamp [181] to the igniter cable bracket [183A].

1) Tighten the bolt [182] to 62-68 pound-inches (7.0-7.7 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(j) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-063-F00

(10) Do these steps to install the fuel nozzle at position 10 (Figure 401, Figure 402, Figure 404):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-056-F01

(11) Do these steps to install the fuel nozzle at position 11 (Figure 401, Figure 402, Figure 410):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23].

(f) Install the three bolts [23] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(g) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-057-F01

(12) Do these steps to install the fuel nozzle at position 12 (Figure 401, Figure 402, Figure 411):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [41] and [227].

(f) Move the hinged bracket [229] into its position on the fuel nozzle flange.

(g) Put the support bracket [228] into its position on the hinged bracket [229] and the fuel nozzle flange.

(h) Install the bolts [41] and [227] in the fuel nozzle flange.

1) Tighten the bolts [41] and [227] to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(i) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [221] and [226].

(j) Use bolt [226] to install the loop clamp [225] to the support bracket [228].

1) Tighten the bolt [226] to 62-68 pound-inches (7.0-7.7 Newton meters).

(k) Use the bolt [221] and nut [224] to install the loop clamps [222] and [223] to the support bracket [228].

1) Tighten the nut [224] to 62-68 pound-inches (7.0-7.7 Newton meters).

(l) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-058-F01

(13) Do these steps to install the fuel nozzle at position 13 (Figure 401, Figure 402, Figure 412):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23].

(f) Install the bolts [23] in the fuel nozzle flange.

1) Tighten the bolts [23] to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(g) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-064-F00

(14) Do these steps to install the fuel nozzle at position 14 (Figure 401, Figure 402, Figure 404):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(g) Install the bolts [23] and [41] in the fuel nozzle flange.
  1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).
  2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:
  1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
    a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
  2) Loosen the coupling nut [25].
  3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
  4) Loosen the coupling nut [25].
  5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
  6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) If the transient bleed air tube is removed, install the air tube.

SUBTASK 73-11-04-420-059-F01

(15) Do these steps to install the fuel nozzle at position 15 (Figure 401, Figure 402, Figure 413):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:
  1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].
  2) Install the preformed packing [22] on the fuel nozzle [24].
  3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:
  1) Put the retainer [29] on the fuel nozzle port.
  2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.
  3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.
  4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Put the PS3 signal tube support bracket [205] in its correct position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.
  1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).
  2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Install the bolt [209] that holds the loop clamp [207] to the support bracket [205].
  1) Tighten the bolt [209] to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) If the 9th stage air manifold and igniter are removed, do these steps:
1) Install the 9th stage air manifold.
2) Install the igniter.

SUBTASK 73-11-04-420-065-F00

(16) Do these steps to install the fuel nozzle at position 16 (Figure 401, Figure 402, Figure 404):
(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.
(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:
1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].
2) Install the preformed packing [22] on the fuel nozzle [24].
3) Install the preformed packing [26] on the fuel manifold [21].
(c) Install a new seal [28] into the retainer [29].
(d) Do these steps to install the fuel nozzle:
1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.
(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].
(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.
(g) Install the bolts [23] and [41] in the fuel nozzle flange.
1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.
(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:
1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) Connect the PS3 line to the combustion case, and to the two PS3 brackets closest to the combustion case.

1) Apply graphite mineral vaseline, D00601 [CP2101] to all tube coupling threads and bolt threads.

2) Tighten the PS3 line connection to 137-152 lb. in. (15.5-17.2 N.m) and safety with safety wire, G02345 [CP8001] or safety wire, G02495 [CP8002].

SUBTASK 73-11-04-420-066-F00

(17) Do these steps to install the fuel nozzle [24] at position 17 (Figure 401, Figure 402, Figure 412):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23].

(f) Install the bolts [23] in the fuel nozzle flange.

1) Tighten the bolts [23] to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(g) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

SUBTASK 73-11-04-420-060-F01

(18) Do these steps to install the fuel nozzle at position 18 (Figure 401, Figure 402, Figure 414):

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [263] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts [23] and [41] to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [262] and [264].

(i) Put the cooling tube bracket [261] in its position on the hinged bracket [263].

(j) Use the bolts [262] to install the cooling tube bracket [261] to the hinged bracket [263].

1) Tighten the bolts [262] to 62-68 pound-inches (7.0-7.7 Newton meters).

(k) Use the bolt [264] to install the loop clamp [265] to the cooling tube bracket [261].

1) Tighten the bolt [264] to 62-68 pound-inches (7.0-7.7 Newton meters).

(l) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(m) Do the applicable steps in the PRSOV task to turn the valve body back into position (TASK 36-11-04-400-801).

1) Connect the two B-nuts on the PRSOV, and tighten the two clamps on the PRSOV tube.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-420-067-F00

(19) Do these steps to install the fuel nozzle at position 19 (Figure 401, Figure 402, Figure 403):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Put the support bracket [42] in its correct position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Install the bolt [44] that holds the loop clamp [43] to the support bracket [42].

1) Tighten the bolt [44] to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Reconnect the LPT cooling air tube to the combustion case and compressor case as follows:

1) Make sure that the metal ring seal is in place.

2) Apply graphite mineral vaseline, D00601 [CP2101] to the bolts

3) Tighten the bolts to 62-68 lb in. (7.0-7.7 N.m) and safety with safety wire, G02345 [CP8001] or safety wire, G02495 [CP8002].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-420-068-F00

(20) Do these steps to install the fuel nozzle at position 20 (Figure 401, Figure 402, Figure 404):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the new preformed packing [22] and preformed packing [26]:

1) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and preformed packing [26].

2) Install the preformed packing [22] on the fuel nozzle [24].

3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) Do the applicable steps in the T3 Sensor Installation task to re-connect the T3 line to the combustion case and to the support bracket (TASK 73-21-07-400-801-F00).

(j) Reconnect the LPT cooling air tube to the combustion case and compressor case as follows:

1) Make sure that the metal ring seal is in place.

2) Apply graphite mineral vaseline, D00601 [CP2101] to the bolts

3) Tighten the bolts to 62-68 lb in. (7.0-7.7 N.m) and safety with safety wire, G02345 [CP8001] or safety wire, G02495 [CP8002].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F. Fuel nozzle leak check

SUBTASK 73-11-04-200-003-F01

(1) Do this task: Fuel Nozzle and Fuel Manifold Leak Check, TASK 73-11-04-200-801-F00.

SUBTASK 73-11-04-420-078-F00

(2) Attach the shrouds [27] to the fuel nozzles [24]:

(a) Apply vaseline, D00672 [CP5070] on the preformed packing [22] and the preformed packing [26].

(b) Move the shroud [27] over the coupling nut [25] of the fuel manifold [21].

(c) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.

(d) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

G. Put the Airplane in a Serviceable Condition

SUBTASK 73-11-04-860-006-F01

(1) Do these steps to put the airplane in a serviceable condition:

(a) Do these steps to put the airplane in a serviceable condition:

1) Remove the DO-NOT-OPERATE tag from the engine start lever.

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

3) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(b) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

H. Fuel Nozzle Installation Test

SUBTASK 73-11-04-700-005-F01

(1) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

SUBTASK 73-11-04-720-001-F01

CAUTION DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(2) If it is necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL NOZZLES/BSV INSTALLED - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the fuel nozzles, SAC engines with the BSV installed.

(2) The installation of the fuel nozzles, SAC engines with the BSV installed.

(3) SAC engines with the BSV installed have two fuel manifolds, one going to every other fuel nozzle. With the BSV removed the engine has only one fuel manifold.

TASK 73-11-04-000-804-F02

2. Fuel Nozzle Removal

A. General

(1) The engine has twenty fuel nozzles.

(a) To remove the fuel nozzle from positions 1, 2, and 20, it is necessary to partially remove the bleed air precooler.

(b) To remove the nozzle from position 7, you must remove the LPT duct.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
36-12-01-800-801	Bleed Air Precooler Disconnection (For Engine Component Removal) (P/B 201)
72-00-00-200-805-F00	Combustion Section Borescope Inspection (P/B 601)
75-22-04-000-802-F00	LPTACC Valve Removal (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-11-04-840-011-F02

(1) Make sure that the engine fuel valves are closed:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure the start levers are in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable start lever.

(c) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

SUBTASK 73-11-04-840-012-F02

(2) Prepare the airplane for the procedure:

(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

WARNING

DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSERS (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Fuel Nozzle Removal

SUBTASK 73-11-04-020-038-F02

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do these steps to remove the fuel nozzle [24] from position 1 or 19 (Figure 401, Figure 402, Figure 403):

(a) For fuel nozzle [24] in position 1, do this task: Bleed Air Precooler Disconnection (For Engine Component Removal), TASK 36-12-01-800-801.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the bolt [44] that holds the loop clamp [43] to the support bracket [42].

(e) Remove the three bolts [23] and [41] from the fuel nozzle flange.

1) Remove the support bracket [42].

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(h) Remove and discard the preformed packing [22] from the fuel nozzle [24].

(i) Remove and discard the preformed packing [26] from the fuel manifold [21].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-039-F02

(2) Do these steps to remove the fuel nozzles from positions 2, 4, 6, 10, 14, 16, or 20 (Figure 401, Figure 402, Figure 404):

NOTE: Access to fuel nozzle 14 is easier when the transient bleed air tube is removed.

(a) For fuel nozzle position 2 or 20, do this task: Bleed Air Precooler Disconnection (For Engine Component Removal), TASK 36-12-01-800-801.

(b) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] from the fuel nozzle [24].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(e) Move the hinged bracket [61] away from the flange of the fuel nozzle.

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(h) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(i) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-020-040-F02

(3) Remove the fuel nozzle from position 3 (Figure 401, Figure 402, Figure 405):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(d) Loosen the bolts [82] on the tube bracket [81].

1) Move the tube bracket [81] away from the fuel nozzle.

(e) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(g) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(h) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(i) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-041-F02

(4) Remove the fuel nozzle from position 5 (Figure 401, Figure 402, Figure 406):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(d) Remove the nut [104] and bolt [102] that hold the loop clamp [101] to the bracket [103].

1) Remove the bracket [103].

(e) Do these steps to remove the fuel nozzle from the combustion case:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.
2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.
1) Remove and discard the seal [28].

(g) Remove the packing [22] from the fuel nozzle [24].
1) Discard the packing [22].

(h) Remove the packing [26] from the fuel manifold [21].
1) Discard the packing [26].

(i) Visually examine the fuel nozzle wear sleeves.
1) If the wear sleeves are dislodged, they are not serviceable.
a) Replace the fuel nozzles.
b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.
2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.
a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-042-F02

(5) Do these steps to remove the fuel nozzle from position 7 (Figure 401, Figure 402, Figure 407):
(a) Do the applicable steps in the LPTACC Valve Removal task to remove the LPT duct (TASK 75-22-04-000-802-F00).

NOTE: You must remove the LPT duct to get access to the number 7 fuel nozzle.

1) Make sure that you install protective covers on the LPT duct, the LPT manifold, and the LPTACC valve.

(b) Disconnect the shroud [27] from the fuel nozzle [24].
1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(c) Disconnect the coupling nut [25] of the fuel manifold [21] from the fuel nozzle [24].
(d) Remove the bolts [143] that hold the loop clamps [142] to the support bracket [141].
(e) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.
1) Remove the support bracket [141].

(f) Do these steps to remove the fuel nozzle from the combustion case:
1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(h) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(i) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-043-F02

(6) Remove the fuel nozzle from position 8 (Figure 401, Figure 402, Figure 408):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolts [163] that holds the strap clamp [162] to the cooling tube bracket [161].

1) Remove the strap clamp [162].

(d) Remove the three bolts [41] from the flange of the fuel nozzle.

1) Remove the cooling tube bracket [161].

(e) Move the hinged bracket [164] away from the fuel nozzle.

(f) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(g) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(h) Remove the packing [22] from the fuel nozzle [24].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Discard the packing [22].

(i) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(j) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(k) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-044-F02

(7) Do these steps to remove the fuel nozzle from position 9 (Figure 401, Figure 402, Figure 409):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolt [182] that holds the loop clamp [181] to the fuel supply bracket [183].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

1) Remove the fuel supply bracket [183].

(e) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(g) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(h) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(i) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.
   a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-045-F02

(8) Remove the fuel nozzle from position 11 (Figure 401, Figure 402, Figure 410):

(a) Disconnect the shroud [27] from the fuel nozzle [24].
   1) Move the shroud [27] to get access the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolt [201] that holds the loop clamp [202] to the support bracket [203].

(d) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.
   1) Remove the support bracket [203].

(e) Do these steps to remove the fuel nozzle from the combustion case:
   1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.
   2) Remove the fuel nozzle.

      NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(f) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.
   1) Remove and discard the seal [28].

(g) Remove the packing [22] from the fuel nozzle [24].
   1) Discard the packing [22].

(h) Remove the packing [26] from the fuel manifold [21].
   1) Discard the packing [26].

(i) Visually examine the fuel nozzle wear sleeves.
   1) If the wear sleeves are dislodged, they are not serviceable.
      a) Replace the fuel nozzles.
      b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.
   2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.
      a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(j) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-046-F02

(9) Remove the fuel nozzle from position 12 (Figure 401, Figure 402, Figure 411):

(a) Disconnect the shroud [27] from the fuel nozzle [24].
   1) Move the shroud [27] to get access the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Remove the nut [224] and bolt [221] that hold the loop clamps [222] and [223] to the support bracket [228].

(d) Remove the bolt [226] that holds the loop clamp [225] to the support bracket [228].

(e) Remove the three bolts [41] and [227] from the flange of the fuel nozzle.

1) Remove the support bracket [228].

(f) Move the hinged bracket [229] away from the fuel nozzle.

(g) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(i) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(j) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(k) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-047-F02

(10) Remove the fuel nozzle from position 13, 15, or 17 (Figure 401, Figure 402, Figure 412):

NOTE: Access to fuel nozzle 15 is easier when the 9th stage air manifold and igniter are removed.

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the three bolts [23] from the flange of the fuel nozzle.

(d) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(e) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

(f) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(g) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(h) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(i) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

SUBTASK 73-11-04-020-048-F02

(11) Remove the fuel nozzle from position 18 (Figure 401, Figure 402, Figure 413):

(a) Disconnect the shroud [27] from the fuel nozzle [24].

1) Move the shroud [27] to get access to the coupling nut [25] on the fuel manifold [21].

(b) Disconnect the coupling nut [25] from the fuel nozzle [24].

(c) Remove the bolt [264] that holds the loop clamp [265] to the cooling tube bracket [261].

(d) Remove the two bolts [262] that hold the cooling tube bracket [261] to the hinged bracket [263].

1) Remove the cooling tube bracket [261].

(e) Remove the three bolts [23] and [41] from the flange of the fuel nozzle.

(f) Move the hinged bracket [263] away from the fuel nozzle.

(g) Do these steps to remove the fuel nozzle from the combustion case:

1) Move the fuel nozzle forward to disengage the fuel nozzle tip from the combustion chamber.

2) Remove the fuel nozzle.

NOTE: You must turn the fuel nozzle 180 degrees clockwise as you remove it from the engine. The tip of the nozzle will point forward as it comes out of the engine.

(h) Remove the seal [28] and retainer [29] assembly from the fuel nozzle port on the combustion case.

1) Remove and discard the seal [28].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(i) Remove the packing [22] from the fuel nozzle [24].

1) Discard the packing [22].

(j) Remove the packing [26] from the fuel manifold [21].

1) Discard the packing [26].

(k) Visually examine the fuel nozzle wear sleeves.

1) If the wear sleeves are dislodged, they are not serviceable.

a) Replace the fuel nozzles.

b) Use a borescope to examine the combustion chamber for downstream damage (TASK 72-00-00-200-805-F00) or continue-in-service for five (5) cycles.

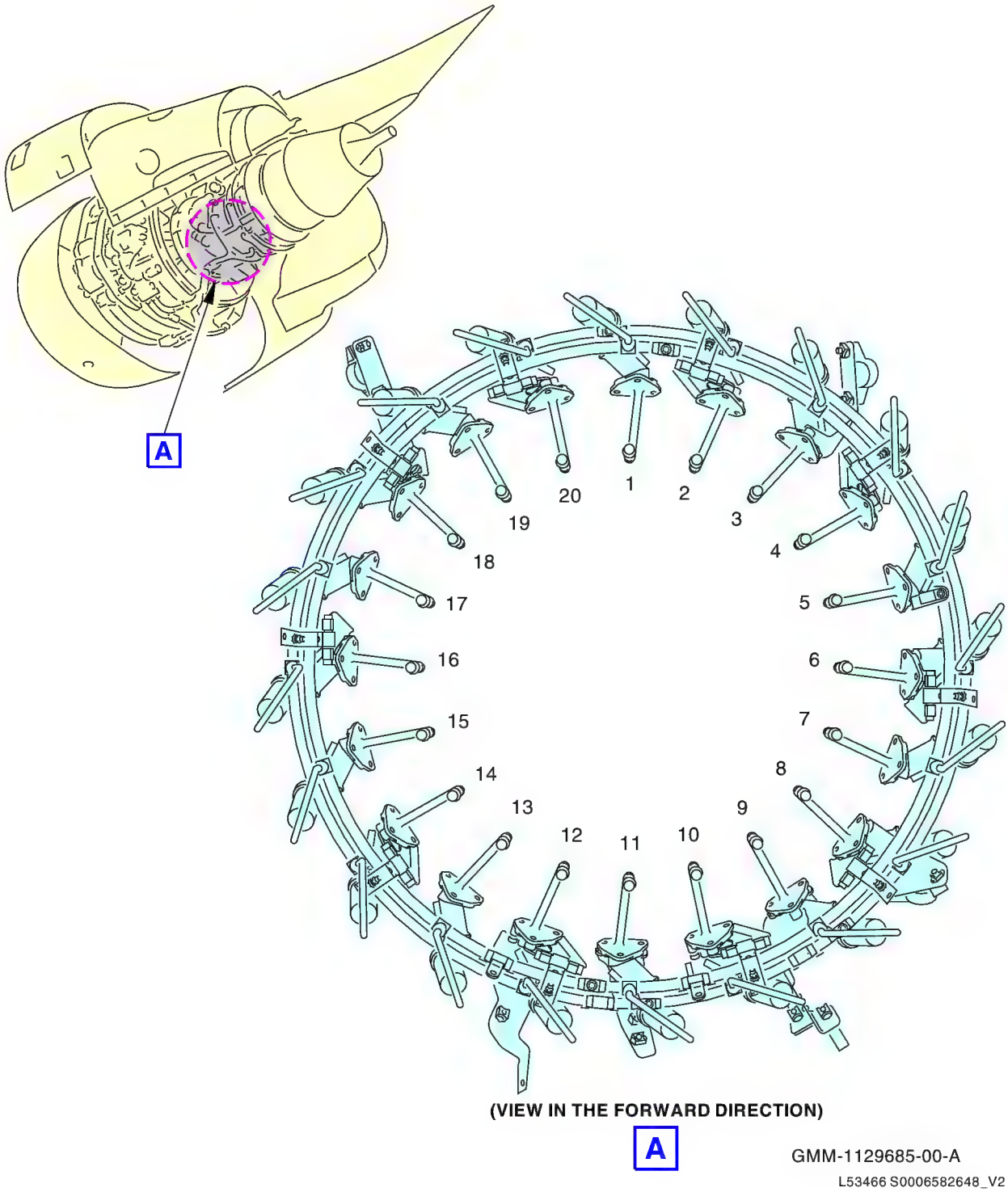
2) If the wear sleeves have four (4) interrupted weld design, they are not serviceable.

a) Replace the fuel nozzles or continue-in-service for five (5) cycles.

(l) Install protective covers on the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

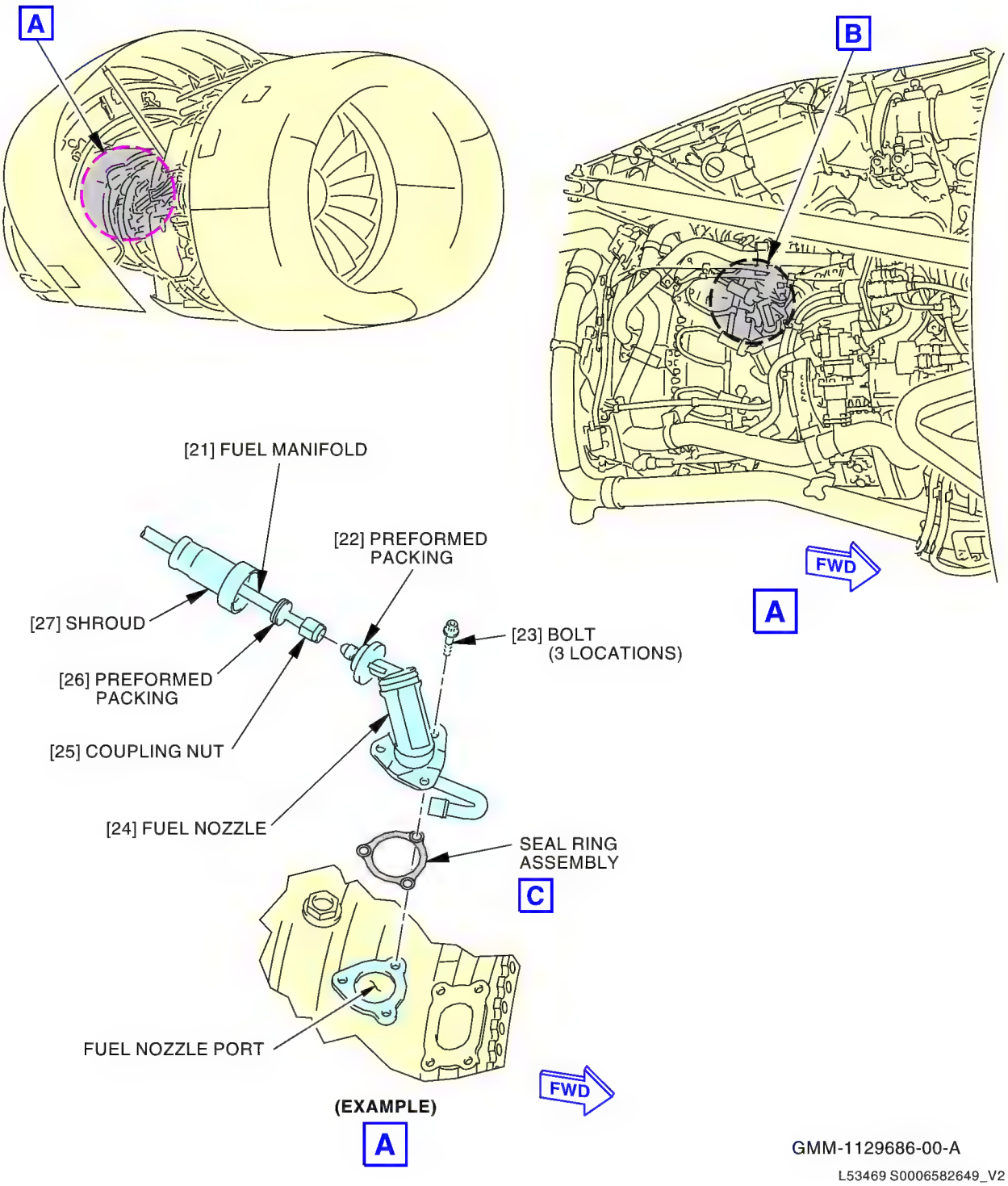
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



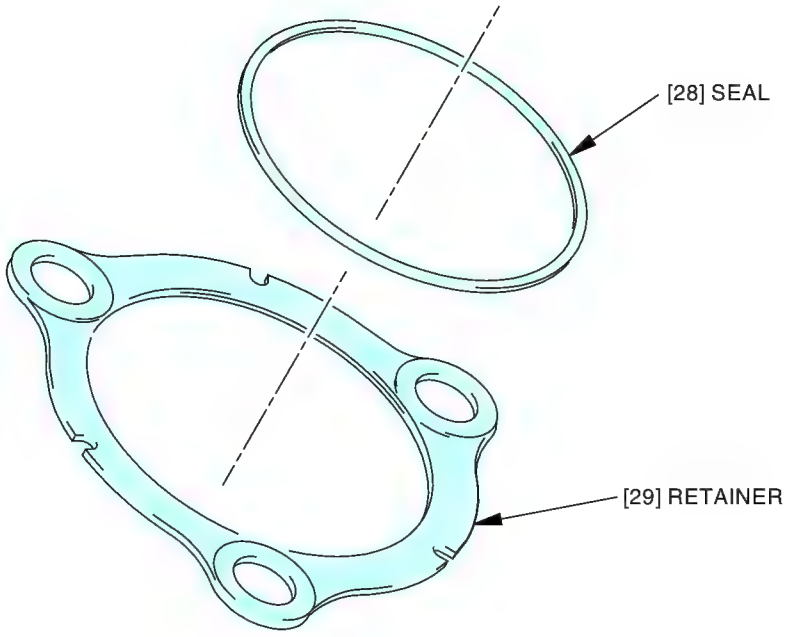
Fuel Nozzle Location
Figure 401/73-11-04-990-844-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Installation
Figure 402/73-11-04-990-845-F02 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



SEAL RING ASSEMBLY (EXAMPLE)

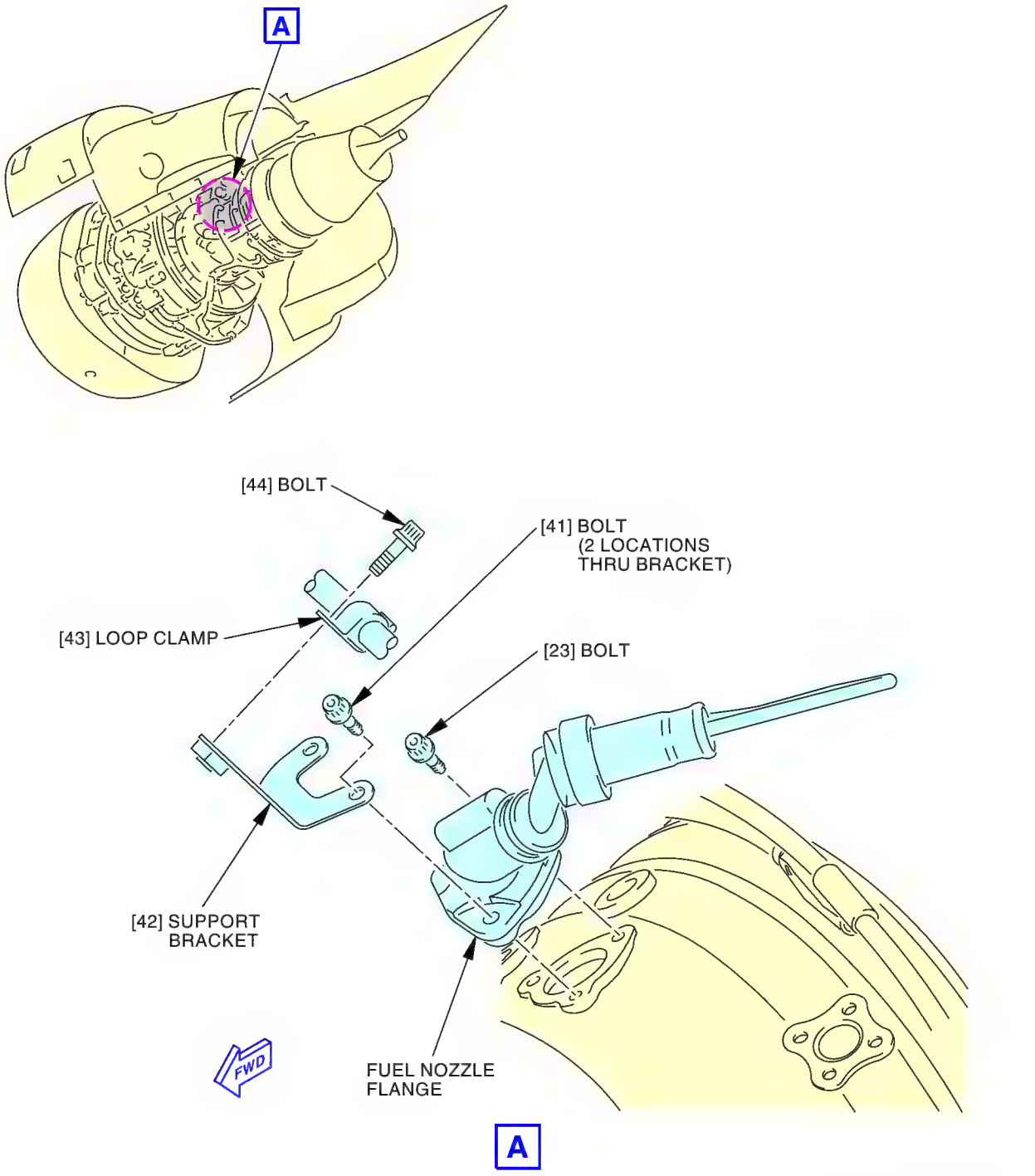
C

GMM-1129687-00-A

L53472 S0006582650_V2

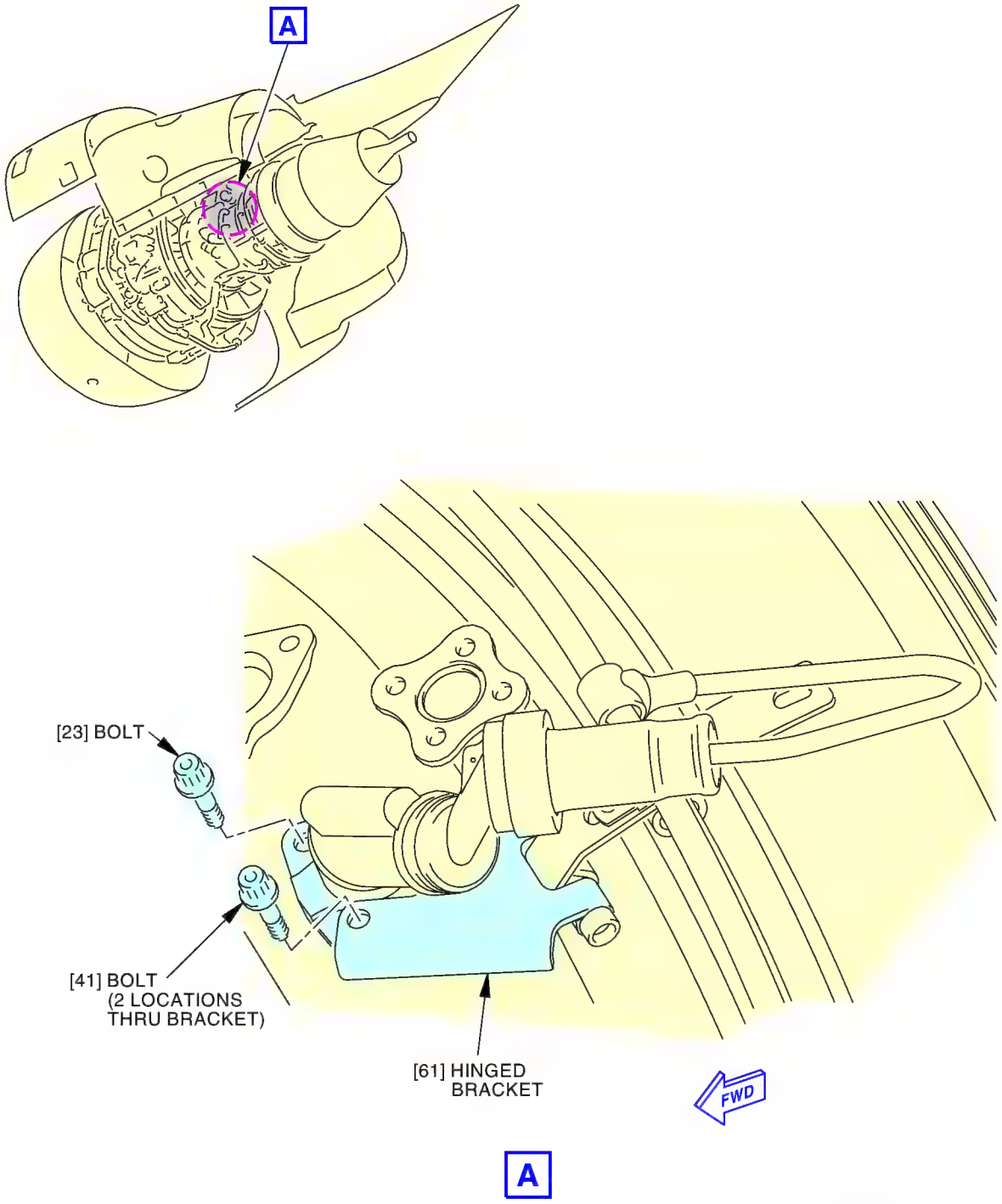
Fuel Nozzle Installation
Figure 402/73-11-04-990-845-F02 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



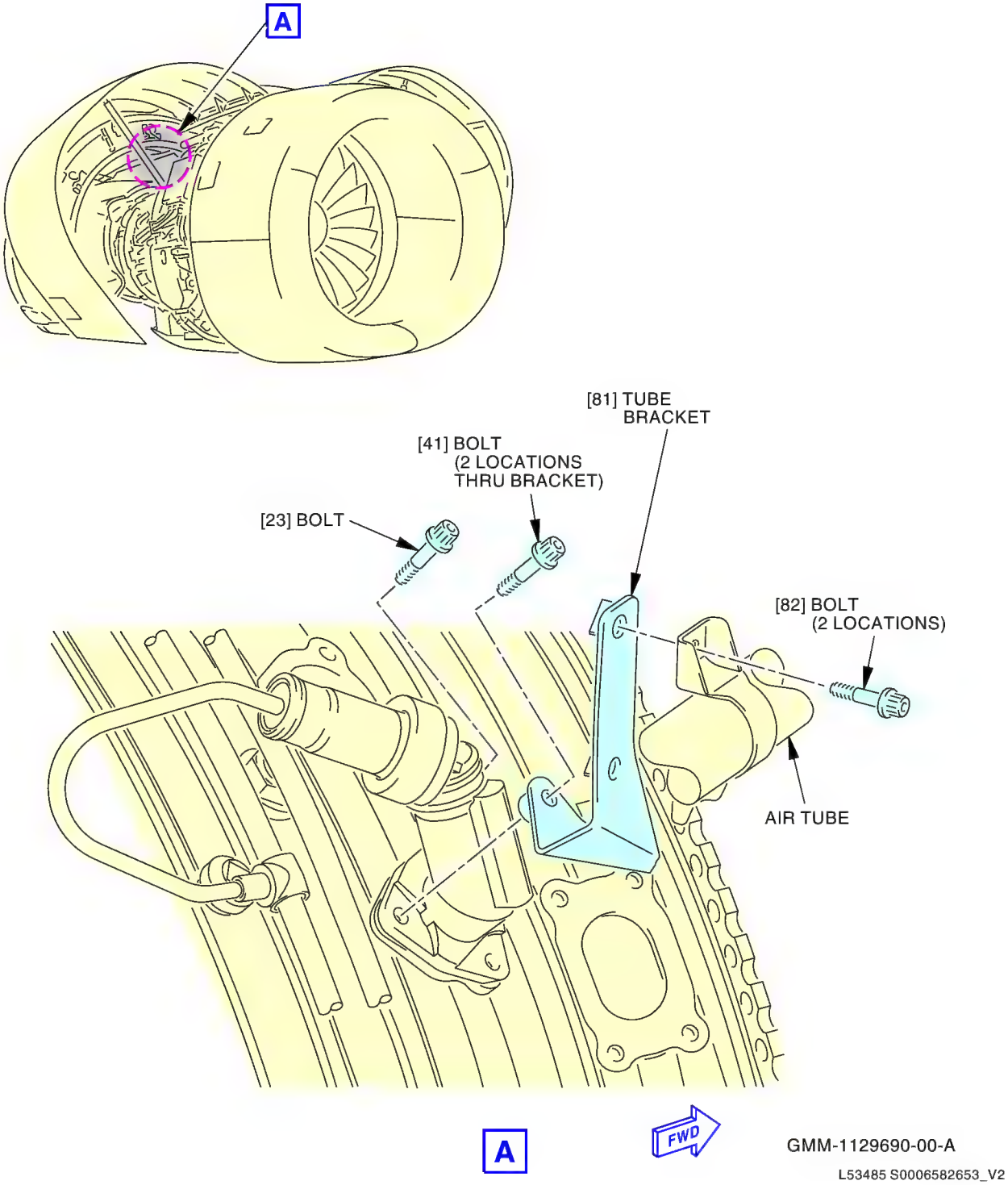
Fuel Nozzle Position 1 and 19 Installation
Figure 403/73-11-04-990-846-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



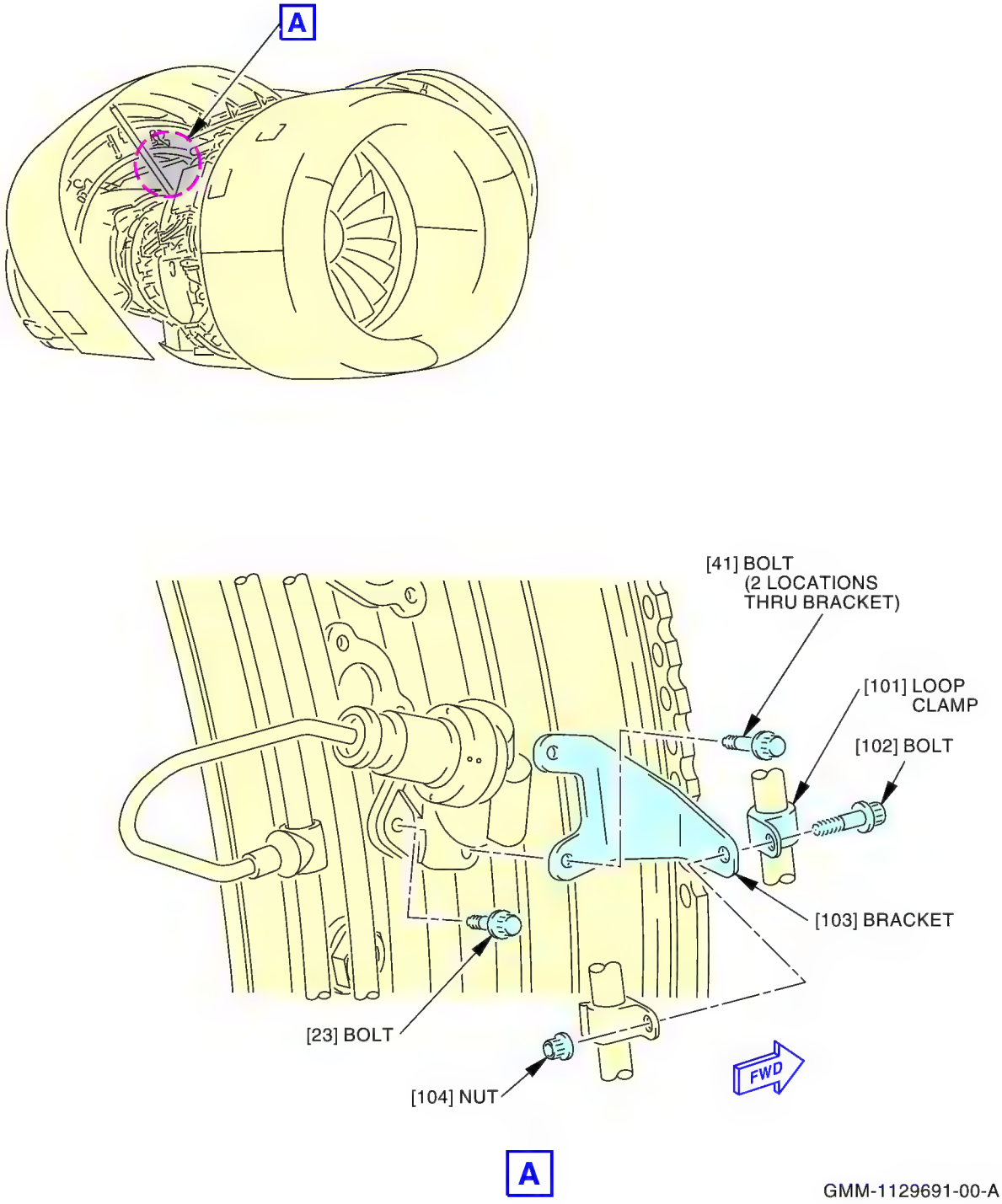
Fuel Nozzle Position 2, 4, 6, 10, 14, 16 and 20 Installation
Figure 404/73-11-04-990-847-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



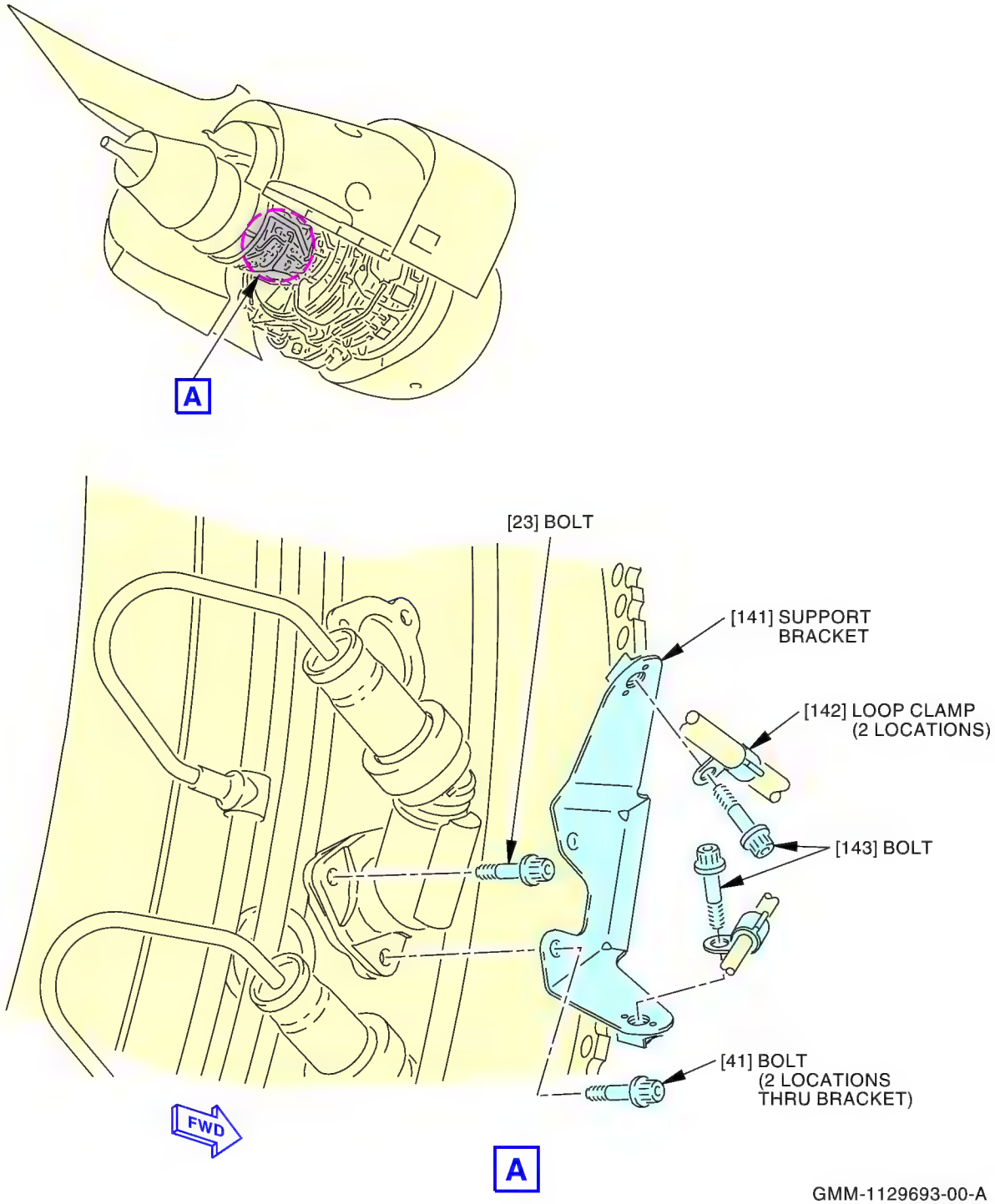
Fuel Nozzle Position 3 Installation
Figure 405/73-11-04-990-848-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



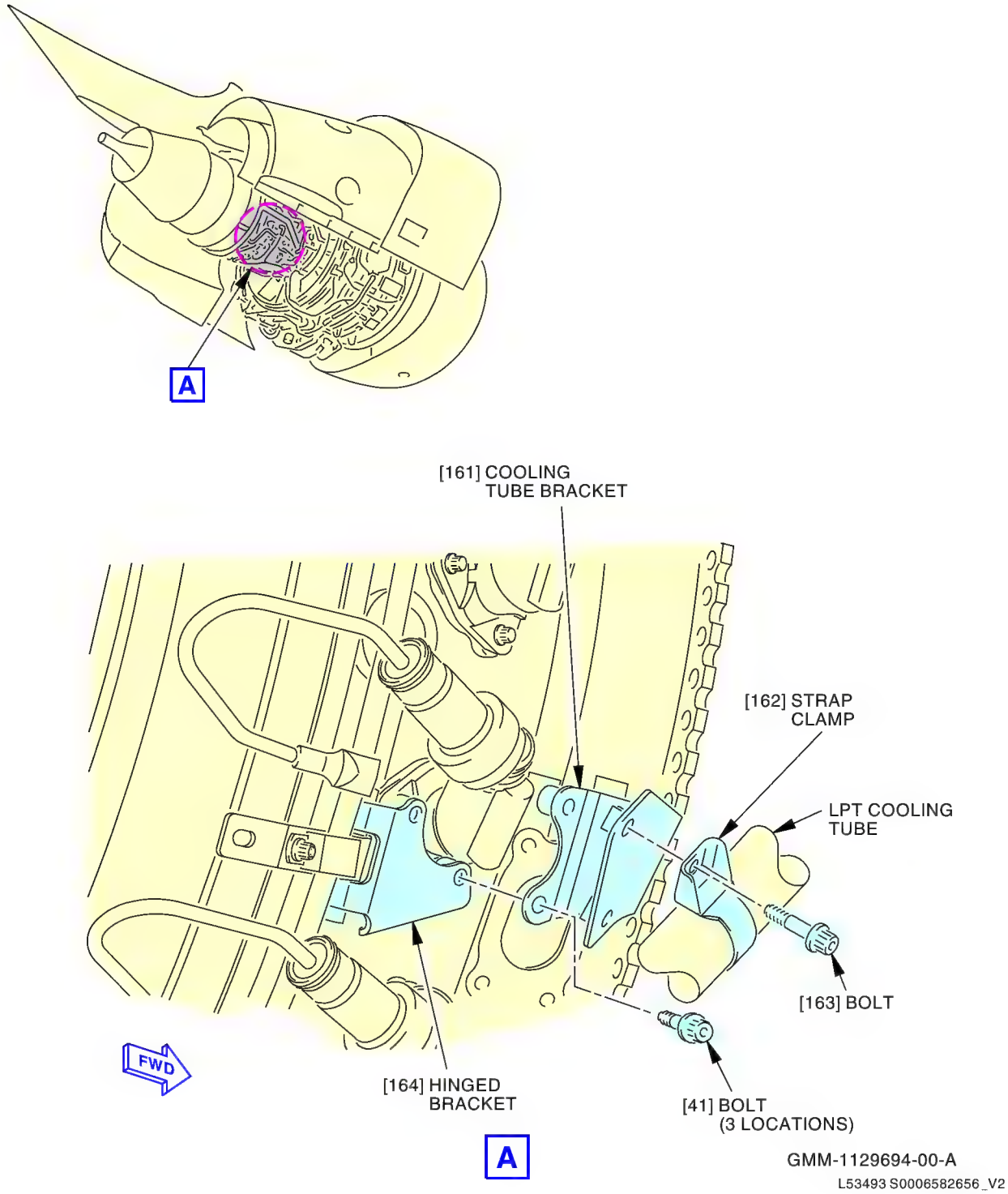
Fuel Nozzle Position 5 Installation
Figure 406/73-11-04-990-849-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



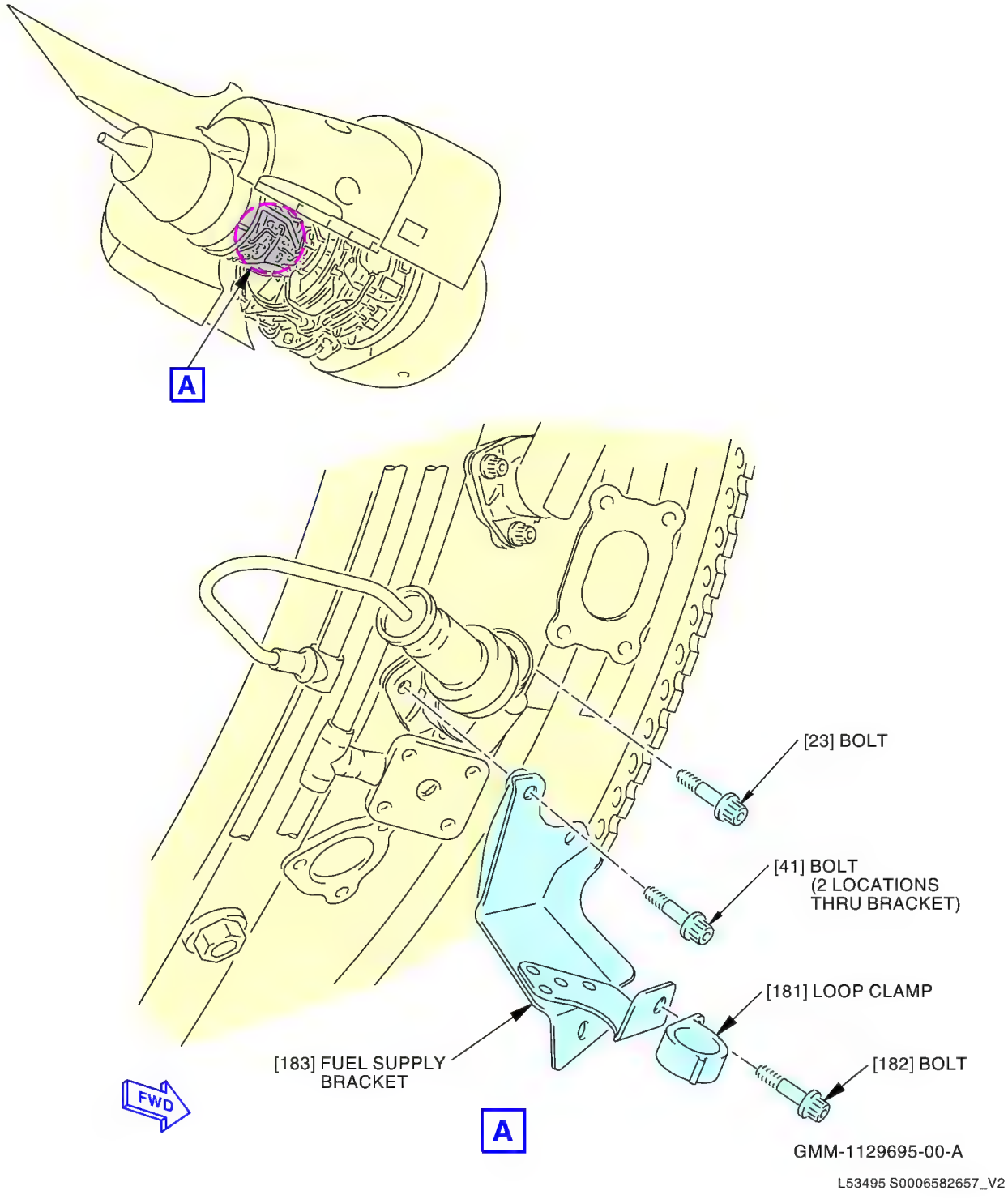
Fuel Nozzle Position 7 Installation
Figure 407/73-11-04-990-850-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



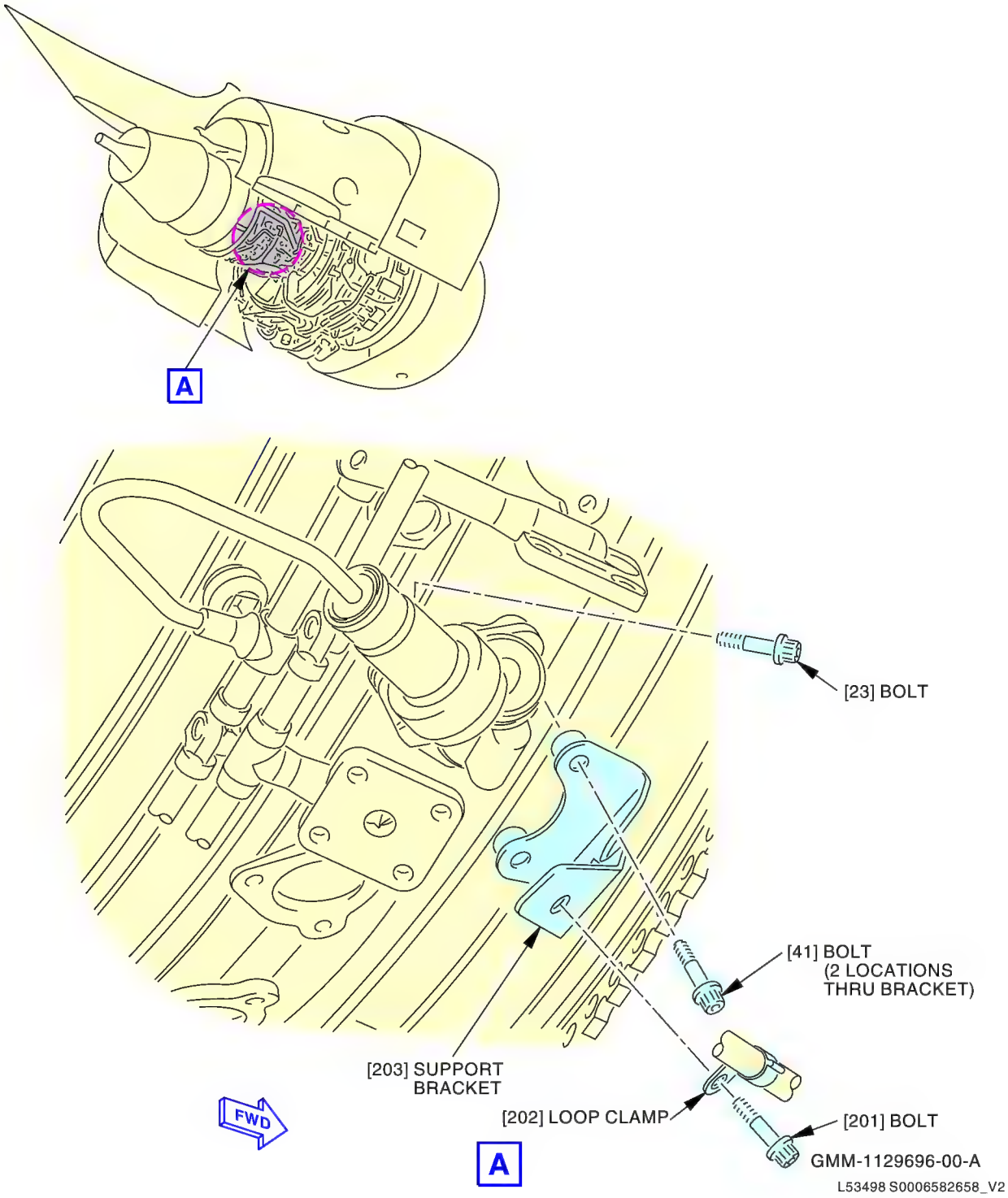
Fuel Nozzle Position 8 Installation
Figure 408/73-11-04-990-851-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



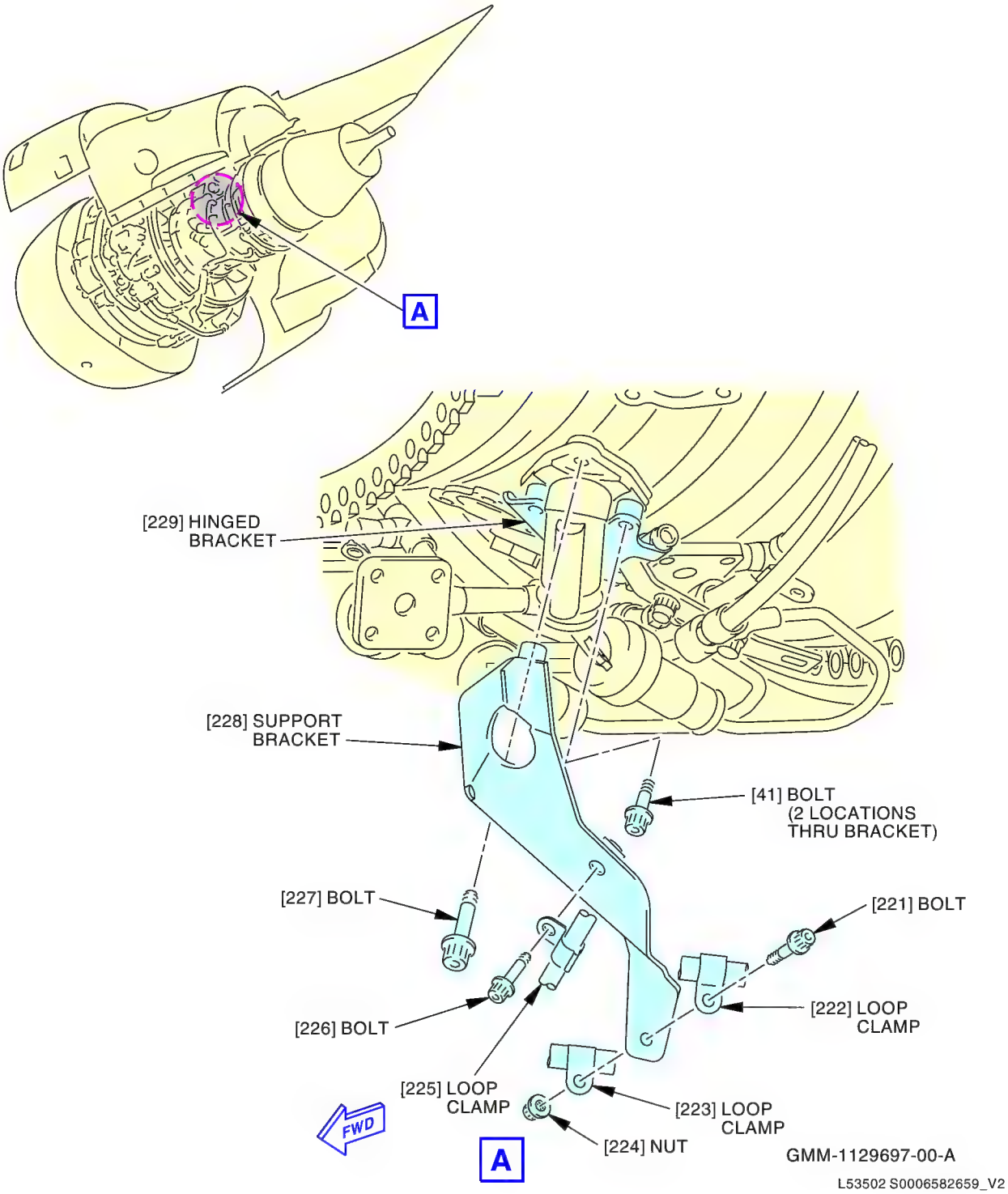
Fuel Nozzle Position 9 Installation
Figure 409/73-11-04-990-852-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



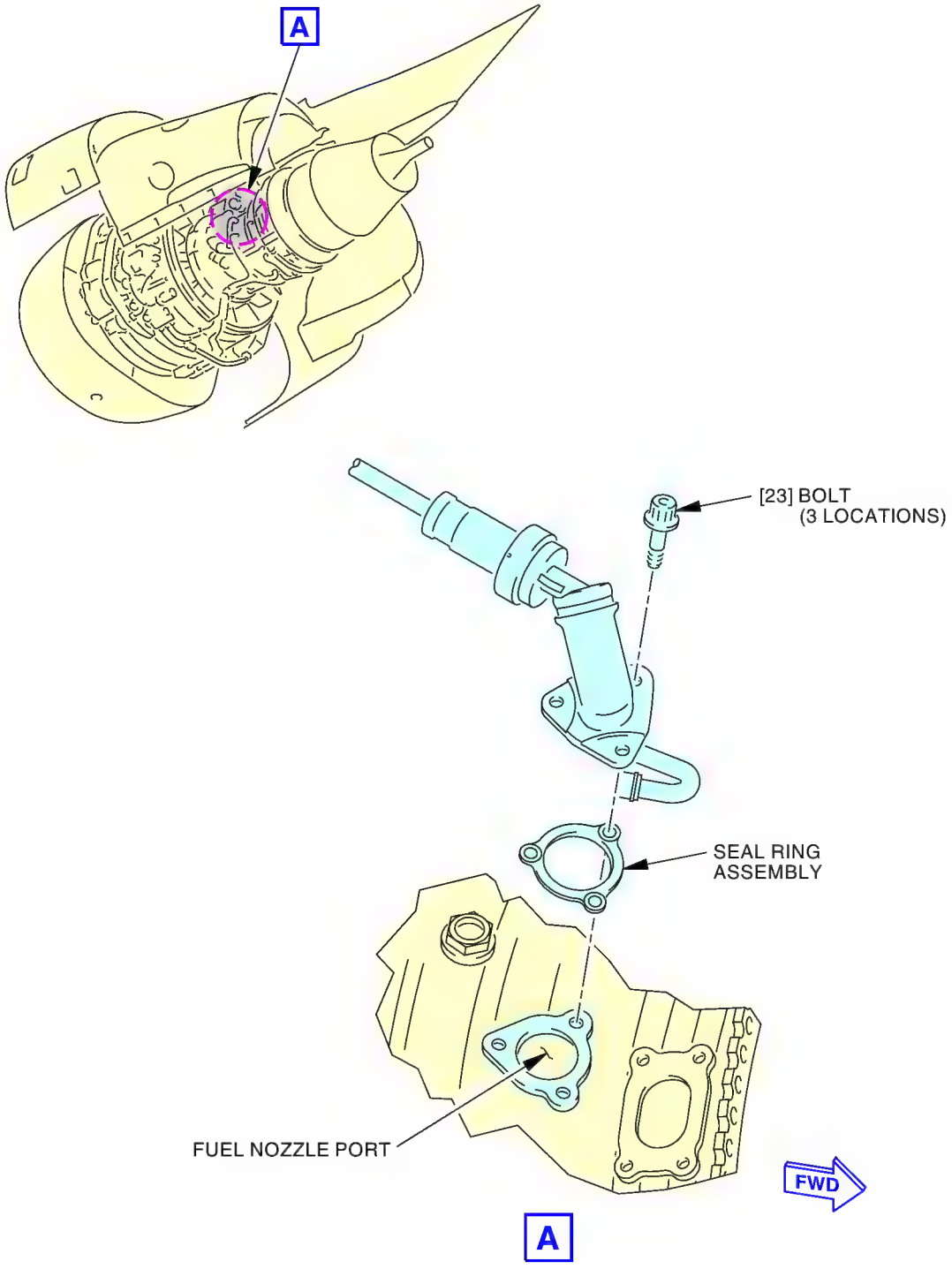
Fuel Nozzle Position 11 Installation
Figure 410/73-11-04-990-853-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



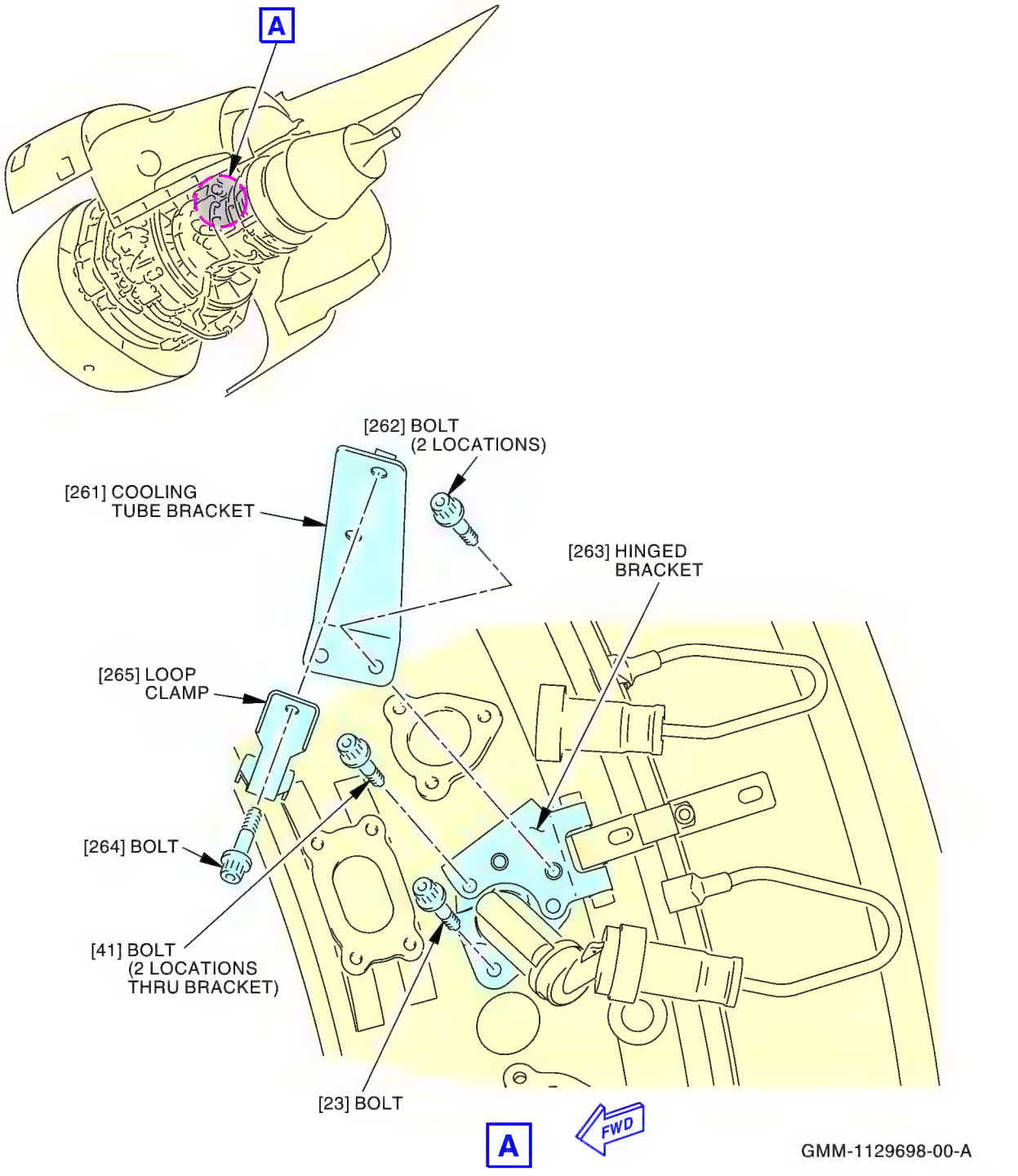
Fuel Nozzle Position 12 Installation
Figure 411/73-11-04-990-854-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Position 13, 15 and 17 Installation
Figure 412/73-11-04-990-855-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Nozzle Position 18 Installation
Figure 413/73-11-04-990-856-F02

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-04-400-804-F02

3. Fuel Nozzle Installation

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-12-01-400-801	Bleed Air Precooler Reconnection (After Engine Component Installation) (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-11-04-200-801-F00	Fuel Nozzle and Fuel Manifold Leak Check (P/B 601)
75-22-04-400-802-F00	LPTACC Valve Installation (P/B 401)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Preformed packing	73-11-04-01-120	IDC 001-006
		73-11-04-04-110	IDC 001-010, 012-999
24	Fuel nozzle	73-11-04-01-085	IDC 001-006
		73-11-04-01-090	IDC 001-006
		73-11-04-04-085	IDC 001-010, 012-999
		73-11-04-04-090	IDC 001-010, 012-999
26	Preformed packing	73-11-04-01-115	IDC 001-006
		73-11-04-04-105	IDC 001-010, 012-999
28	Seal	73-11-04-01-110	IDC 001-006
		73-11-04-04-100	IDC 001-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Fuel Nozzle Installation

SUBTASK 73-11-04-420-038-F02

(1) Do these steps to install the fuel nozzle [24] at position 1 or 19 (Figure 401, Figure 402, Figure 403):

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packing [22] and packing [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].
2) Install the preformed packing [22] on the fuel nozzle [24].
3) Install the preformed packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle [24] into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Put the support bracket [42] in its correct position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Install the bolt [44] that holds the loop clamp [43] to the support bracket [42].

1) Tighten the bolt [44] to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].
2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].
3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.
4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

(k) For fuel nozzle position 1, do this task: Bleed Air Precooler Reconnection (After Engine Component Installation), TASK 36-12-01-400-801.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-420-039-F02

(2) Do these steps to install the fuel nozzle at position 2, 4, 6, 10, 14, 16, or 20 (Figure 401, Figure 402, Figure 404):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].

2) Install the packing [22] on the fuel nozzle [24].

3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle counter-clockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the hinged bracket [61] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(i) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].

2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].

3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.

4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

(j) For fuel nozzle positions 2 and 20, do this task: Bleed Air Precooler Reconnection (After Engine Component Installation), TASK 36-12-01-400-801.

(k) For fuel nozzle position 14, install the transient bleed air tube if it is removed.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-420-040-F02

(3) Do these steps to install the fuel nozzle at position 3 (Figure 401, Figure 402, Figure 405):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].

2) Install the packing [22] on the fuel nozzle [24].

3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].

(f) Move the tube bracket [81] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.6 Newton meters)

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Tighten the bolts [82] on the tube bracket to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].

2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].

3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.

4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

SUBTASK 73-11-04-420-041-F02

(4) Do these steps to install the fuel nozzle at position 5 (Figure 401, Figure 402, Figure 406):

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].
2) Install the packing [22] on the fuel nozzle [24].
3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the bracket [103] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Use the bolt [102] and nut [104] to connect the loop clamp [101] to the bracket [103].

1) Tighten the nut [104] to 62-68 pound-inches (7.0-7.7 Newton meters).

(i) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(j) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].
2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].
3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.
4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

SUBTASK 73-11-04-420-042-F02

(5) Do these steps to attach the fuel nozzle at position No. 7 to the combustion case (Figure 401, Figure 402, Figure 407):

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].
2) Install the packing [22] on the fuel nozzle [24].
3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the support bracket [141] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [143].

(i) Install the bolts [143] to attach the loop clamps [142] to the support bracket [141].

1) Tighten the bolts [143] to 62-68 pound-inches (7.0-7.7 Newton meters).

(j) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(k) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].
2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].
3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.
4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

(l) Do the applicable steps in the LPTACC Valve R/I to install the LPT duct (TASK 75-22-04-400-802-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-420-043-F02

(6) Do these steps to install the fuel nozzle at position 8 (Figure 401, Figure 402, Figure 408):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].

2) Install the packing [22] on the fuel nozzle [24].

3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [41].

(f) Move the hinged bracket [164] into its position on the fuel nozzle flange.

(g) Put the cooling tube bracket [161] on the fuel nozzle flange and hinged bracket [164].

(h) Install the bolts [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(i) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolt [163].

(j) Put the strap clamp [162] on the LPT cooling tube.

(k) Use the bolts [163] to connect the strap clamp [162] to the cooling tube bracket [161].

1) Tighten the bolts to 62-68 pound-inches (7.0-7.7 Newton meters).

(l) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(m) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].

2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].

3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

SUBTASK 73-11-04-420-044-F02

(7) Do these steps to install the fuel nozzle at position 9 (Figure 401, Figure 402, Figure 409):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].

2) Install the packing [22] on the fuel nozzle [24].

3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the fuel supply bracket [183] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolt [182].

(i) Use the bolt [182] to connect the loop clamp [181] to the fuel supply bracket [183].

1) Tighten the bolt [182] to 62-68 pound-inches (7.0-7.7 Newton meters).

(j) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(k) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].

2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].

3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

SUBTASK 73-11-04-420-045-F02

(8) Do these steps to install the fuel nozzle at position 11 (Figure 401, Figure 402, Figure 410):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].

2) Install the packing [22] on the fuel nozzle [24].

3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolts [23] and [41].

(f) Put the support bracket [203] into its position on the fuel nozzle flange.

(g) Install the bolts [23] and [41] in the fuel nozzle flange.

1) Tighten the bolts to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 on the threads of the bolt [201].

(i) Use the bolt [201] to install the loop clamp [202] to the support bracket [203].

1) Tighten the bolt [201] to 62-68 pound-inches (7.0-7.7 Newton meters).

(j) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(k) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].

2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].

3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

SUBTASK 73-11-04-420-046-F02

(9) Do these steps to install the fuel nozzle at position 12 (Figure 401, Figure 402, Figure 411):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].

2) Install the packing [22] on the fuel nozzle [24].

3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.

2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.

3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.

4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [41] and [227].

(f) Move the hinged bracket [229] into its position on the fuel nozzle flange.

(g) Put the support bracket [228] into its position on the hinged bracket [229] and the fuel nozzle flange.

(h) Install the bolts [41] and [227] in the fuel nozzle flange.

1) Tighten the bolts [41] and [227] to 110-120 pound-inches (12.4-13.2 Newton meters).

2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(i) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [221] and [226].

(j) Use bolt [226] to install the loop clamp [225] to the support bracket [228].

1) Tighten the bolt [226] to 62-68 pound-inches (7.0-7.7 Newton meters).

(k) Use the bolt [221] and nut [224] to install the loop clamps [222] and [223] to the support bracket [228].

1) Tighten the nut [224] to 62-68 pound-inches (7.0-7.7 Newton meters).

(l) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].

a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

2) Loosen the coupling nut [25].

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

4) Loosen the coupling nut [25].

5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(m) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].
2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].
3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.
4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

SUBTASK 73-11-04-420-047-F02

(10) Do these steps to install the fuel nozzle [24] at position 13, 15, or 17 (Figure 401, Figure 402, Figure 412):

(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.

(b) Do these steps to install the packings [22] and [26]:

1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].
2) Install the packing [22] on the fuel nozzle [24].
3) Install the packing [26] on the fuel manifold [21].

(c) Install a new seal [28] into the retainer [29].

(d) Do these steps to install the fuel nozzle:

1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.

(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23].

(f) Install the bolts [23] in the fuel nozzle flange.

1) Tighten the bolts [23] to 110-120 pound-inches (12.4-13.2 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.

(g) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:

1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
   a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].
3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(h) Attach the shroud [27] to the fuel nozzle [24]:

1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].
3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.
4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

(11) For fuel nozzle position 15, do these steps:
(a) Install the 9th stage air manifold if it is removed.
(b) Install the igniter if it is removed.

SUBTASK 73-11-04-420-048-F02

(12) Do these steps to install the fuel nozzle [24] at position 18 (Figure 401, Figure 402, Figure 413):
(a) Remove the protective cover from the fuel nozzle, the fuel nozzle port, and the fuel manifold connection.
(b) Do these steps to install the packings [22] and [26]:
1) Apply vaseline, D00672 [CP5070] on the new packings [22] and [26].
2) Install the packing [22] on the fuel nozzle [24].
3) Install the packing [26] on the fuel manifold [21].
(c) Install a new seal [28] into the retainer [29].
(d) Do these steps to install the fuel nozzle:
1) Put the retainer [29] on the fuel nozzle port.
2) Put the fuel nozzle into the fuel nozzle port, with the tip forward.
3) Turn the fuel nozzle 180 degrees counterclockwise while you move it on to the combustion case pad.
4) Move the fuel nozzle aft to engage the tip in the combustion chamber.
(e) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [23] and [41].
(f) Move the hinged bracket [263] into its position on the fuel nozzle flange.
(g) Install the bolts [23] and [41] in the fuel nozzle flange.
1) Tighten the bolts [23] and [41] to 110-120 pound-inches (12.4-13.2 Newton meters).
2) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts.
(h) Apply graphite mineral vaseline, D00601 [CP2101] or Never-Seez NSBT compound, D00006 to the threads of the bolts [262] and [264].
(i) Put the cooling tube bracket [261] in its position on the hinged bracket [263].
(j) Use the bolts [262] to install the cooling tube bracket [261] to the hinged bracket [263].
1) Tighten the bolts [262] to 62-68 pound-inches (7.0-7.7 Newton meters).
(k) Use the bolt [264] to install the loop clamp [265] to the cooling tube bracket [261].
1) Tighten the bolt [264] to 62-68 pound-inches (7.0-7.7 Newton meters).
(l) Do these steps to install the coupling nut [25] of the fuel manifold [21] to the fuel nozzle [24]:
1) Connect the coupling nut [25] to the nipple on the fuel nozzle [24].
a) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
2) Loosen the coupling nut [25].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
4) Loosen the coupling nut [25].
5) Tighten the coupling nut [25] to 140-150 pound-inches (16-17 Newton meters).
6) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the coupling nut [25].

(m) Attach the shroud [27] to the fuel nozzle [24]:
1) Apply vaseline, D00672 [CP5070] on the packings [22] and [26].
2) Slide the shroud [27] over the coupling nut [25] of the fuel manifold [21].
3) Tighten the shroud [27] on the fuel nozzle until no more than two threads are seen.
4) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud [27].

F. Fuel nozzle leak check

SUBTASK 73-11-04-200-004-F01

(1) Do this task: Fuel Nozzle and Fuel Manifold Leak Check, TASK 73-11-04-200-801-F00.

G. Put the Airplane in a Serviceable Condition

SUBTASK 73-11-04-860-005-F02

(1) Do these steps to put the airplane in a serviceable condition:
(a) Do these steps to put the airplane in a serviceable condition:

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.
2) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(b) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.
1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

H. Fuel Nozzle Installation Test

SUBTASK 73-11-04-700-004-F02

(1) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

SUBTASK 73-11-04-720-002-F02

CAUTION DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(2) If it is necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL NOZZLES - INSPECTION/CHECK

1. General

A. This procedure has one task, the leak check of the fuel nozzles and fuel manifold.

TASK 73-11-04-200-801-F00

2. Fuel Nozzle and Fuel Manifold Leak Check

A. General

(1) Do this procedure when you replace one or more of the fuel nozzles.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
73-11-03-000-802-F00	Fuel Nozzle Filter Removal (SAC) (P/B 401)
73-11-03-400-802-F00	Fuel Nozzle Filter Installation (SAC) (P/B 401)
73-11-04-000-804-F02	Fuel Nozzle Removal (P/B 401)
73-11-04-000-805-F01	Fuel Nozzle Removal (P/B 401)
73-11-04-400-804-F02	Fuel Nozzle Installation (P/B 401)
73-11-04-400-805-F01	Fuel Nozzle Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1115	Source - Nitrogen, 0-100 PSIG

D. Consumable Materials

Reference	Description	Specification
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Check

SUBTASK 73-11-04-840-003-F00

(1) Make sure that the engine fuel valves are closed:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure the start levers are in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable start lever.

(c) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

WARNING

DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSERS (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

G. Do the Check

SUBTASK 73-11-04-010-001-F00

(1) Do this task: Fuel Nozzle Filter Removal (SAC), TASK 73-11-03-000-802-F00.

SUBTASK 73-11-04-680-001-F00

(2) Do these steps to drain the fuel manifold:

(a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the fuel nozzle at the 6:00 O'clock position.

CAUTION

USE TWO WRENCHES TO LOOSEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(b) Disconnect the manifold from the fuel nozzle at the 6:00 O'clock position:

1) Disconnect the shroud from the fuel nozzle at the 6:00 O'clock position.

a) Move the shroud to get access to the coupling nut on the fuel manifold.

2) Use two wrenches to disconnect the coupling nut from the fuel nozzle at the 6:00 O'clock position.

(c) Disconnect the manifold from the fuel nozzle at the 12:00 O'clock position:

1) Disconnect the shroud from the fuel nozzle at the 12:00 O'clock position.

a) Move the shroud to get access to the coupling nut on the fuel manifold.

2) Use two wrenches to disconnect the coupling nut from the fuel nozzle at the 12:00 O'clock position.

(d) Let the fuel drain into the container.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Use your hand to connect the manifold coupling nut to the nipple on the two fuel nozzles at the 6:00 and 12:00 O'clock positions.

(f) Do these steps to tighten the coupling nuts at the 6:00 O'clock and 12:00 O'clock positions:

CAUTION USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

1) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).
2) Use two wrenches to loosen the coupling nut.
3) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).
4) Use two wrenches to loosen the coupling nut.
5) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

(g) Do not attach the shrouds to the fuel nozzle at this time.

SUBTASK 73-11-04-480-001-F00

(3) Connect 0-100 PSIG nitrogen source, STD-1115 to the fuel manifold fitting where the fuel nozzle filter was removed.

SUBTASK 73-11-04-160-001-F00

(4) Do these steps to remove fuel that remains in the manifold:

WARNING MAKE SURE THAT THERE IS NO OPEN FLAME OR OTHER SOURCE OF IGNITION NEAR THE ENGINE. THE FUEL VAPORS CAN CATCH FIRE. IF THERE IS A FIRE, IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

(a) Put 80 to 100 psig (551 to 689 kPa) of nitrogen through the fuel manifold.

(b) Decrease the pressure to zero.

H. Leak Check

SUBTASK 73-11-04-790-001-F00

(1) Do the Leak Check of the Fuel Nozzle:

(a) Disconnect the shrouds from all of the fuel nozzles.

WARNING MAKE SURE THAT THERE IS NO OPEN FLAME OR OTHER SOURCE OF IGNITION NEAR THE ENGINE. THE FUEL VAPORS CAN CATCH FIRE. IF THERE IS A FIRE, IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

(b) Put 10 psig (69 kPa) of nitrogen into the fuel manifold.

1) Make sure that the check valves in the fuel nozzles do not open at this pressure.
2) Slowly increase the pressure to 15 psig (104 kPa).
3) Make sure that the check valves in the fuel nozzles do not open as the pressure increases.

a) If a check valve opens, then replace the fuel nozzle.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

These are the tasks:

Fuel Nozzle Removal, TASK 73-11-04-000-805-F01 or Fuel Nozzle Removal, TASK 73-11-04-000-804-F02,

Fuel Nozzle Installation, TASK 73-11-04-400-805-F01 or Fuel Nozzle Installation, TASK 73-11-04-400-804-F02.

(c) Slowly increase the pressure until one of the check valves in the fuel nozzles opens.

1) Make sure that a check valve opens before you reach 60 psig (414 kPa).

NOTE: A check valve will usually open before you reach 30 psig (207 kPa).

(d) Slowly decrease the pressure until the check valves in the fuel nozzles are closed.

(e) Use Snoop Leak Detector compound, G00091 to look for leaks at the fuel nozzle coupling nuts and the fuel manifold.

1) If you find a leak, then continue.

2) If you do not find a leak, then do the steps below to Put the Airplane in a Serviceable Condition.

SUBTASK 73-11-04-900-001-F00

(2) If you find a leak in the tubes of the fuel manifold, then replace the engine.

These are the tasks:

Power Plant - Removal, TASK 71-00-02-000-801-F00,

Power Plant - Installation, TASK 71-00-02-400-801-F00.

SUBTASK 73-11-04-200-001-F00

(3) If you find a leak at the fuel nozzle coupling nuts, then do these steps:

(a) Use two wrenches to disconnect the fuel nozzle coupling nut.

(b) Visually examine the ferrule and seat of the coupling nut and the seat of the fuel nozzle.

1) If the ferrule and seat of the coupling nut is damaged, then replace the engine.

These are the tasks:

Power Plant - Removal, TASK 71-00-02-000-801-F00,

Power Plant - Installation, TASK 71-00-02-400-801-F00.

2) If the seat of the fuel nozzle is damaged, then replace the fuel nozzle.

These are the tasks:

Fuel Nozzle Removal, TASK 73-11-04-000-805-F01 or Fuel Nozzle Removal, TASK 73-11-04-000-804-F02,

Fuel Nozzle Installation, TASK 73-11-04-400-805-F01 or Fuel Nozzle Installation, TASK 73-11-04-400-804-F02.

(c) If no problem is found, then use your hand to connect the manifold coupling nut to the fuel nozzle.

1) Do these steps to tighten the coupling nut:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CAUTION: USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

a) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

b) Use two wrenches to loosen the coupling nut.

c) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

d) Use two wrenches to loosen the coupling nut.

e) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

(d) Do the Leak Check (above) again.

1) If you find a leak, then replace the applicable fuel nozzle (TASK 73-11-04-000-805-F01 or TASK 73-11-04-000-804-F02 and TASK 73-11-04-400-805-F01 or TASK 73-11-04-400-804-F02).

2) If you do not find a leak, then do the steps below to Put the Airplane in a Serviceable Condition.

I. Put the Airplane in a Serviceable Condition

SUBTASK 73-11-04-800-001-F00

(1) If you loosened a fuel nozzle coupling nut, then make sure that you correctly tightened it.

(a) Do these steps to correctly tighten the coupling nut:

CAUTION: USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

1) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

2) Use two wrenches to loosen the coupling nut.

3) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

4) Use two wrenches to loosen the coupling nut.

5) Use two wrenches to tighten the coupling nut to 140-150 pound-inches (16-17 Newton meters).

SUBTASK 73-11-04-410-001-F00

(2) Attach the shrouds to the fuel nozzles:

(a) Apply vaseline, D00672 [CP5070] on the preformed packings.

(b) Slide the shrouds over the coupling nuts of the fuel manifold.

(c) Tighten the shrouds until no more than two threads are seen.

(d) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the shroud.

SUBTASK 73-11-04-080-001-F00

(3) Remove the 0-100 PSIG nitrogen source, STD-1115 from the fuel manifold fitting.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-04-410-002-F00

(4) Do this task: Fuel Nozzle Filter Installation (SAC), TASK 73-11-03-400-802-F00.

SUBTASK 73-11-04-840-004-F00

WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 73-11-04-840-005-F00

(6) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(a) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

SUBTASK 73-11-04-840-006-F00

(7) Do this task: Test 3A - Idle-Power Leak Check, TASK 71-00-00-700-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL MANIFOLD - INSPECTION/CHECK

1. General

A. This procedure has one task, the inspection of the fuel manifold.

TASK 73-11-05-700-801-F00

2. Fuel Manifold - Inspection/Check

(Figure 601)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
26-11-02-400-802	Core Fire Detection Harness - Installation (P/B 401)
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
73-11-04-000-804-F02	Fuel Nozzle Removal (P/B 401)
73-11-04-000-805-F01	Fuel Nozzle Removal (P/B 401)
73-11-04-400-804-F02	Fuel Nozzle Installation (P/B 401)
73-11-04-400-805-F01	Fuel Nozzle Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

C. Procedure

SUBTASK 73-11-05-840-001-F00

WARNING DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSERS (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 73-11-05-900-001-F00

(2) If you find damage to the fuel manifold that is not in the limits, then replace the engine, unless you are given other instructions.

NOTE: The fuel manifold is not a Line Replaceable Unit (LRU). To remove the fuel manifold, you must disassemble the engine.

(a) These are the tasks:

Power Plant - Removal, TASK 71-00-02-000-801-F00,

Power Plant - Installation, TASK 71-00-02-400-801-F00.

SUBTASK 73-11-05-210-001-F00

(3) Visually examine the fuel manifold tubes:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Cracks, splits, or kinks in the manifold tubes are not acceptable.

(b) Wrinkles in the bends of the manifold tubes are acceptable with this limit:

1) The depth of the wrinkle must be less than 3 percent of the outside diameter of the tube.

(c) Dents in the manifold are acceptable with these limits:

1) Not more than one dent in one linear foot (0.305 M) of the tube.

2) The depth of the dent must be less than 20 percent of the outside diameter of the tube.

3) The minimum radius of the dent must be greater than 0.070 inch (1.78 mm).

(d) Nicks, scratches, scores, and chafed areas are acceptable with this limit:

1) The depth of the nick, scratch, score, and chafed area must be less than 0.005 inch (0.13 mm) in depth after the tube is blended to a smooth radius.

SUBTASK 73-11-05-210-002-F00

(4) Examine the fuel nozzle supply tubes:

(a) Cracks, splits, or kinks in the nozzle supply tubes are not acceptable.

(b) Wrinkles in the bends of the nozzle supply tubes are acceptable with these limits:

1) The depth of the wrinkle must be less than 3 percent of the outside diameter of the tube.

(c) Dents in the nozzle supply tubes are acceptable with these limits:

1) Not more than one dent in each of the tubes.

2) The depth of the dent must be less than 20 percent of the outside diameter of the tube.

3) The minimum radius of the dent must be greater than 0.070 inch (1.78 mm).

(d) Flattened areas in the nozzle supply tubes are acceptable with these limits:

1) The length of the flattened area must be less than 2 times the outside diameter of the tube.

2) The flattened area must change the contour of the tube by less than 10 percent of its outside diameter.

(e) Nicks, scratches, scores, and chafed areas are acceptable with this limit:

1) The depth of the nick, scratch, score, and chafed area must be less than 0.005 inch (0.13 mm) in depth after the tube is blended to a smooth radius.

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES

2) For fuel nozzle supply tube number 7, the maximum limit of depth for nick, scratch, score, and chafed area is 0.018 inch (0.45 mm) after removal of high metal.

a) Make sure that there is minimum clearance of 0.125 inch (3.17 mm) with the bolt of the fire detector harness bracket (TASK 26-11-02-400-802).

SUBTASK 73-11-05-210-004-F00

NOTE: Do this inspection if the fuel manifold shroud coupling nut has been disconnected from its mating surface.

(5) Visually examine the threads of the fuel manifold shroud coupling nut for damage.

(a) Damage must be less than one-half of a thread, cumulative or continuous.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES (Continued)

SUBTASK 73-11-05-900-005-F00

(6) If you find damage to the shroud coupling nut thread that is not in limits, then replace the shroud coupling nut. These are the steps:

(a) Remove the fuel nozzle that mates with the damaged shroud coupling nut. Do this task, Fuel Nozzle Removal, TASK 73-11-04-000-805-F01 or Fuel Nozzle Removal, TASK 73-11-04-000-804-F02.

(b) With applicable tool, remove the retaining ring from the shroud.

(c) Slide the shroud aft and remove it from the fuel manifold tube.

(d) Slide the shroud coupling nut off the shroud. If the shroud coupling nut does not remove easily from the shroud, replace the shroud coupling nut and the shroud.

(e) Install the shroud coupling nut on the shroud. Make sure that the open portion of the nut will face aft when the shroud is installed on the fuel manifold tube.

(f) Install the shroud on the fuel manifold tube. Make sure that the open portion of the shroud faces aft after installation.

(g) With the applicable tool, install the retaining ring in the shroud. After installation, apply pressure to the retaining ring to make sure it is retained in the groove in the shroud.

(h) Install the fuel nozzle, do this task Fuel Nozzle Installation, TASK 73-11-04-400-805-F01 or Fuel Nozzle Installation, TASK 73-11-04-400-804-F02.

IDC ALL

SUBTASK 73-11-05-900-003-F00

(7) If you find damage to the fuel manifold that is not in the limits, then replace the engine, unless you are given other instructions.

NOTE: The fuel manifold is not a Line Replaceable Unit (LRU). To remove the fuel manifold, you must disassemble the engine.

(a) These are the tasks:

Power Plant - Removal, TASK 71-00-02-000-801-F00,

Power Plant - Installation, TASK 71-00-02-400-801-F00.

SUBTASK 73-11-05-900-002-F00

(8) Do these steps to prepare to examine the nipples and ferrules:

NOTE: Do this portion of the fuel manifold inspection if you think you have a leak or if you find damage after you removed a fuel nozzle.

(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

SUBTASK 73-11-05-210-003-F00

(9) Examine the mating surfaces of the nipples and ferrules:

(a) If not already done, disconnect the fuel supply tube from the applicable fuel nozzle (TASK 73-11-04-000-805-F01 or TASK 73-11-04-000-804-F02).

(b) Axial scratches in Areas A and C are acceptable after the surface is blended smooth.

(c) Axial scratches in Area B are not acceptable.

(d) Circumferential scratches in Areas A and C are acceptable after the surface is blended smooth.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Circumferential scratches in Area B are acceptable with these limits:

1) The surface is blended smooth.

2) The scratch is too small to measure with a 0.040 inch (1.02 mm) radius ball scriber.

(f) Nicks and pits in Areas A, B, and C are not acceptable.

(g) Damaged threads are acceptable with these limits:

1) Use a tap or a die to chase the damaged threads.

2) After you chase the threads, the damage must be less than one-half of a thread, cumulative or continuous.

(h) Connect the fuel supply tube to the applicable fuel nozzle (TASK 73-11-04-400-805-F01 or TASK 73-11-04-400-804-F02).

SUBTASK 73-11-05-900-004-F00

(10) If you find damage to the fuel nozzle that is not in the limits, then replace the Fuel Nozzle.

(a) These are the tasks:

Fuel Nozzle Removal, TASK 73-11-04-000-805-F01 or Fuel Nozzle Removal, TASK 73-11-04-000-804-F02,

Fuel Nozzle Installation, TASK 73-11-04-400-805-F01 or Fuel Nozzle Installation, TASK 73-11-04-400-804-F02.

SUBTASK 73-11-05-840-002-F00

(11) Put the airplane in a serviceable condition:

(a) If you want to supply electrical power, do this task: Supply Electrical Power, TASK 24-22-00-860-811.

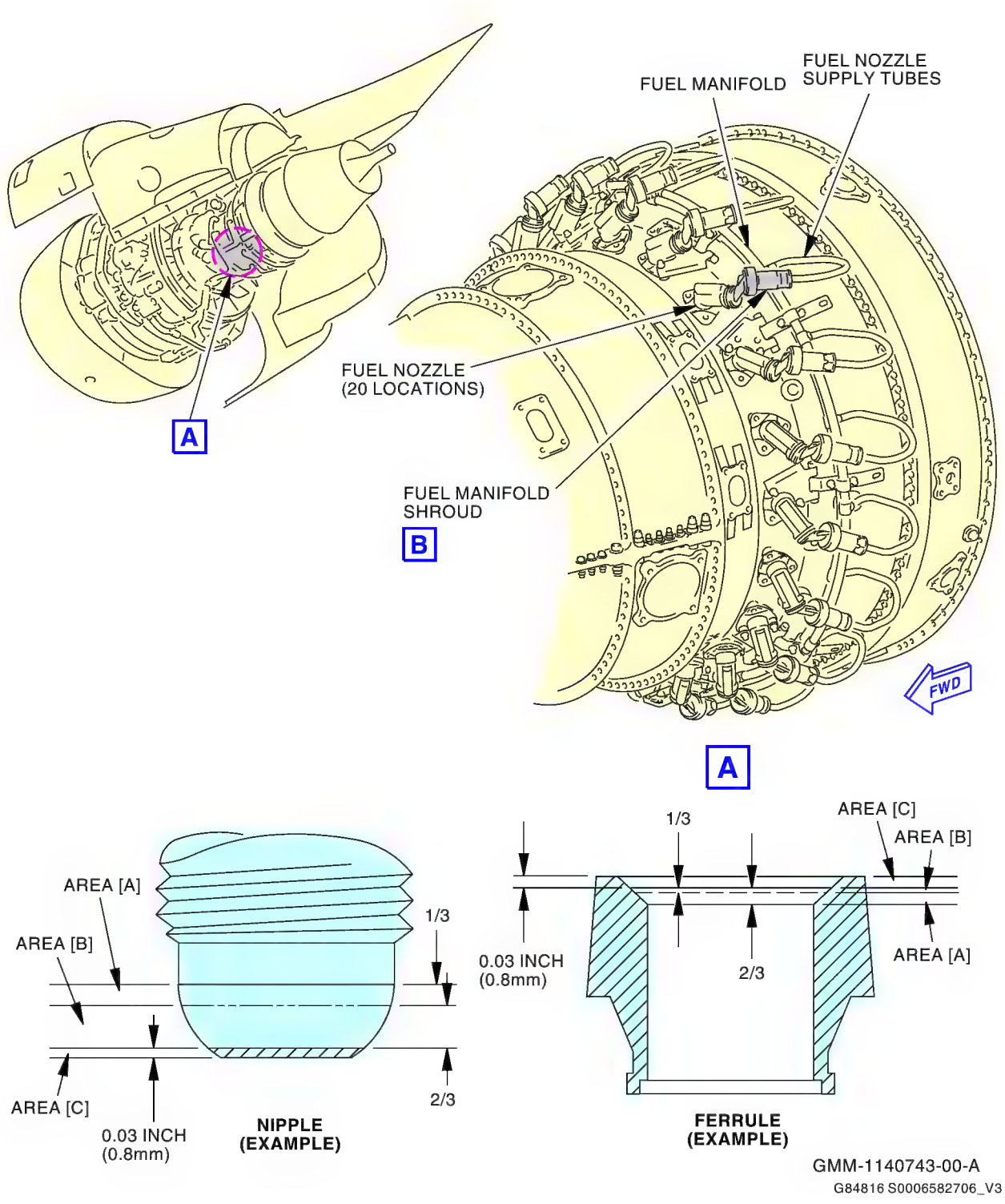
1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

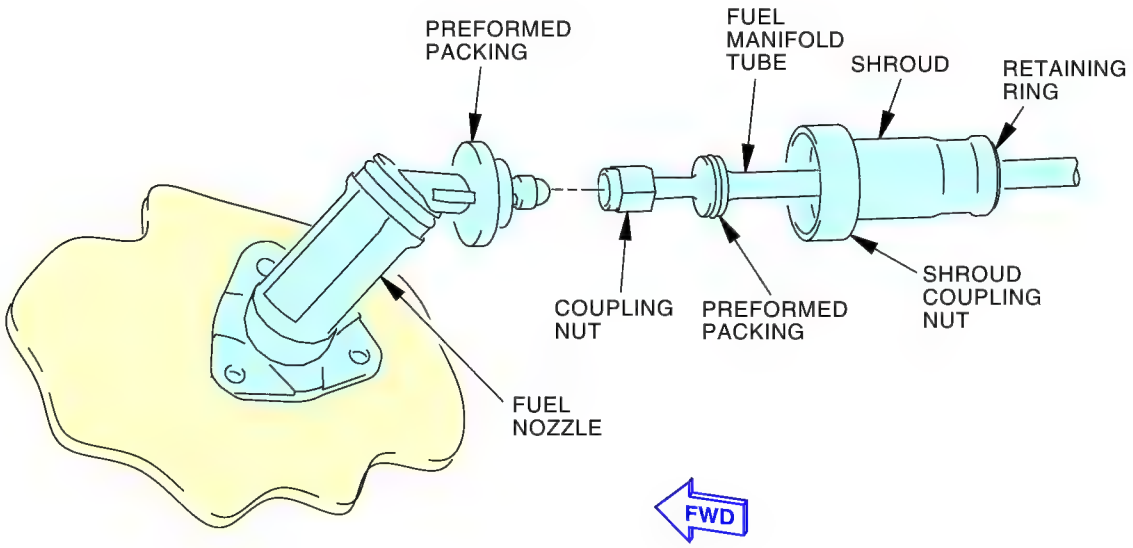
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Manifold and Nozzles Inspection
Figure 601/73-11-05-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



FUEL MANIFOLD SHROUD (EXAMPLE)

B

1730667 S0000312783_V2

Fuel Manifold and Nozzles Inspection
Figure 601/73-11-05-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDG OIL COOLER - REMOVAL/INSTALLATION

1. General

A. This procedure contains the following tasks:

(1) A removal of the IDG oil cooler

(2) An installation of the IDG oil cooler.

TASK 73-11-06-000-801-F00

2. IDG Oil Cooler Removal

(Figure 401)

A. General

(1) The engine has one IDG oil cooler.

(2) The IDG oil cooler is on the fan frame, aft of the lubrication unit, at the 7:00 o'clock position.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 73-11-06-840-001-F00

(1) Prepare for the procedure as follows:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure that the engine start lever is in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

(c) Make sure that the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

(d) Make sure that the SPAR VALVE CLOSED light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the spar shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on P5-13 panel is set to OFF and install a DO-NOT-OPERATE tag.

(f) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. IDG Oil Cooler Removal

SUBTASK 73-11-06-020-002-F00

(1) Open the 1/4-turn Omega clamps [10].

(a) Remove the J5, J6, J7, and J8 wire harnesses from the Omega clamps [10].

(b) Move the wire harnesses away from the IDG oil cooler [5].

1) If it is necessary, use string or tape to hold the wires out of your way.

SUBTASK 73-11-06-680-001-F00

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(2) Drain the IDG oil cooler [5] as follows:

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, under the IDG oil cooler [5].

(b) Remove the drain plug [20].

1) Let the oil drain into the container.

(c) Remove and discard the O-ring [15] from the drain plug [20].

(d) Keep the drain plug [20] for the subsequent installation.

SUBTASK 73-11-06-020-003-F00

(3) Remove the bracket [25] as follows:

(a) Remove the bolt [40], washer [45], and clamp [35] that attach the oil-out tube [30] to the bracket [25].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the bolts [50] and the washers [55] that attach the bracket [25] to the IDG oil cooler [5].

1) Remove the bracket [25] from the IDG oil cooler [5].

(c) Keep the container under the IDG oil cooler [5] to catch the unwanted fuel and oil that flows during the removal procedure.

SUBTASK 73-11-06-020-004-F00

(4) Disconnect the fuel-in tube [60] from the IDG oil cooler [5] as follows:

(a) Remove the bolts [70] that attach the fuel-in tube [60] and the gasket [65] to the IDG oil cooler [5].

(b) Move the fuel-in tube [60] out of the way, to make sure that it is not damaged.

1) If it is necessary, use lockwire or tape to keep the tube out of the way.

2) If the gasket [65] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to this task (TASK 70-30-01-910-802-F00) for gasket and seal maintenance practices.

(c) Install protective covers on the fuel-in tube [60] and the IDG oil cooler [5].

SUBTASK 73-11-06-020-005-F00

(5) Disconnect the fuel-out tube [80] from the IDG oil cooler [5] as follows:

(a) Remove the bolts [75] that attach the fuel-out tube [80] and the gasket [85] to the IDG oil cooler [5].

(b) Move the fuel-out tube [80] out of the way, to make sure that it is not damaged.

1) If it is necessary, use lockwire or tape to keep the tube out of the way.

2) If the gasket [85] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to this task (TASK 70-30-01-910-802-F00) for gasket and seal maintenance practices.

(c) Install protective covers on the fuel-out tube [80] and the IDG oil cooler [5].

SUBTASK 73-11-06-020-006-F00

CAUTION

MAKE SURE THAT YOU USE TWO WRENCHES TO LOOSEN TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE FITTING. USE THE OTHER WRENCH TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(6) Disconnect the oil tube [30] and tube [90] from the IDG oil cooler [5] as follows:

(a) Use two wrenches to disconnect the oil-out tube [30] from the IDG oil cooler [5].

(b) Use two wrenches to disconnect the oil-in tube [90] from the IDG oil cooler [5].

SUBTASK 73-11-06-020-001-F00

(7) Remove the IDG oil cooler [5]:

IDC ALL PRE SB CFM56-7B-72-040

(a) Loosen the nuts [97] and bolts [95] that attach the IDG oil cooler [5] to the forward bracket.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB CFM56-7B-72-040

(b) Loosen the bolts [95] that attach the IDG oil cooler [5] to the forward bracket.

IDC ALL

(c) Loosen the bolts [110] that attach the IDG oil cooler [5] to the aft bracket.

IDC ALL PRE SB CFM56-7B-72-040

(d) Hold the IDG oil cooler [5] with your hand and remove the bolts [95], washers [96], and nuts [97].

IDC ALL POST SB CFM56-7B-72-040

(e) Hold the IDG oil cooler [5] with your hand and remove the bolts [95] and washers [96].

IDC ALL

(f) Hold the IDG oil cooler [5] with your hand and remove the bolts [110] and washers [111].

(g) Carefully remove the IDG oil cooler [5] from the engine.

1) Make sure that you do not damage the electrical harnesses as you remove the cooler.

(h) Install protective covers on the oil tube nipple [120] and nipple [135], the oil-out tube [30] and the oil-in tube [90].

SUBTASK 73-11-06-020-007-F00

(8) Remove the oil tube nipple [120] and nipple [135], for installation on the replacement IDG oil cooler [5]:

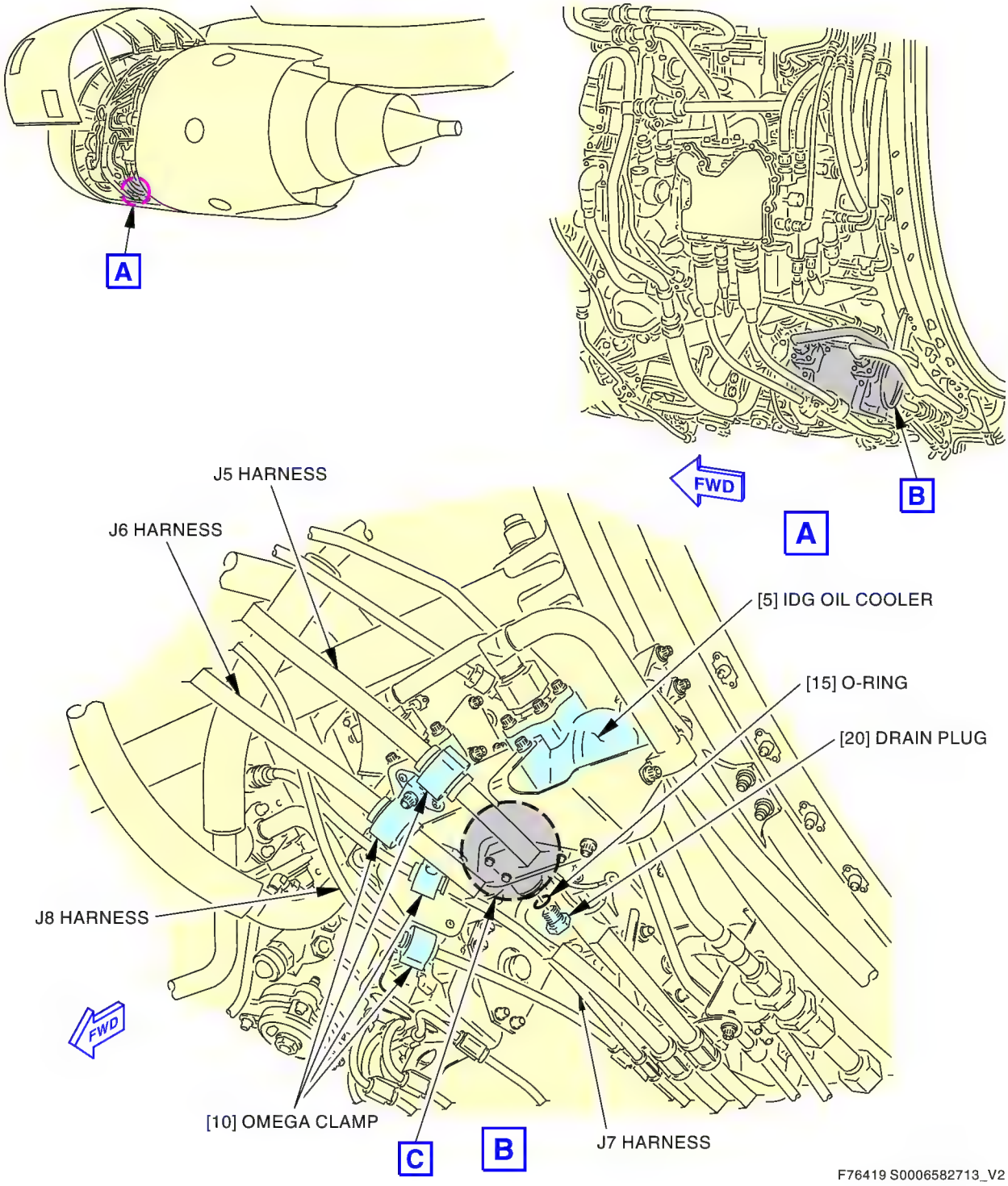
(a) Remove the bolts [130] that attaches the oil-out nipple [120] to the IDG oil cooler [5].

(b) Remove the bolts [145] that attaches the oil-in nipple [135] to the IDG oil cooler [5].

(c) Install protective covers on the oil-out nipple [120], the oil-in nipple [135], and the IDG oil cooler [5].

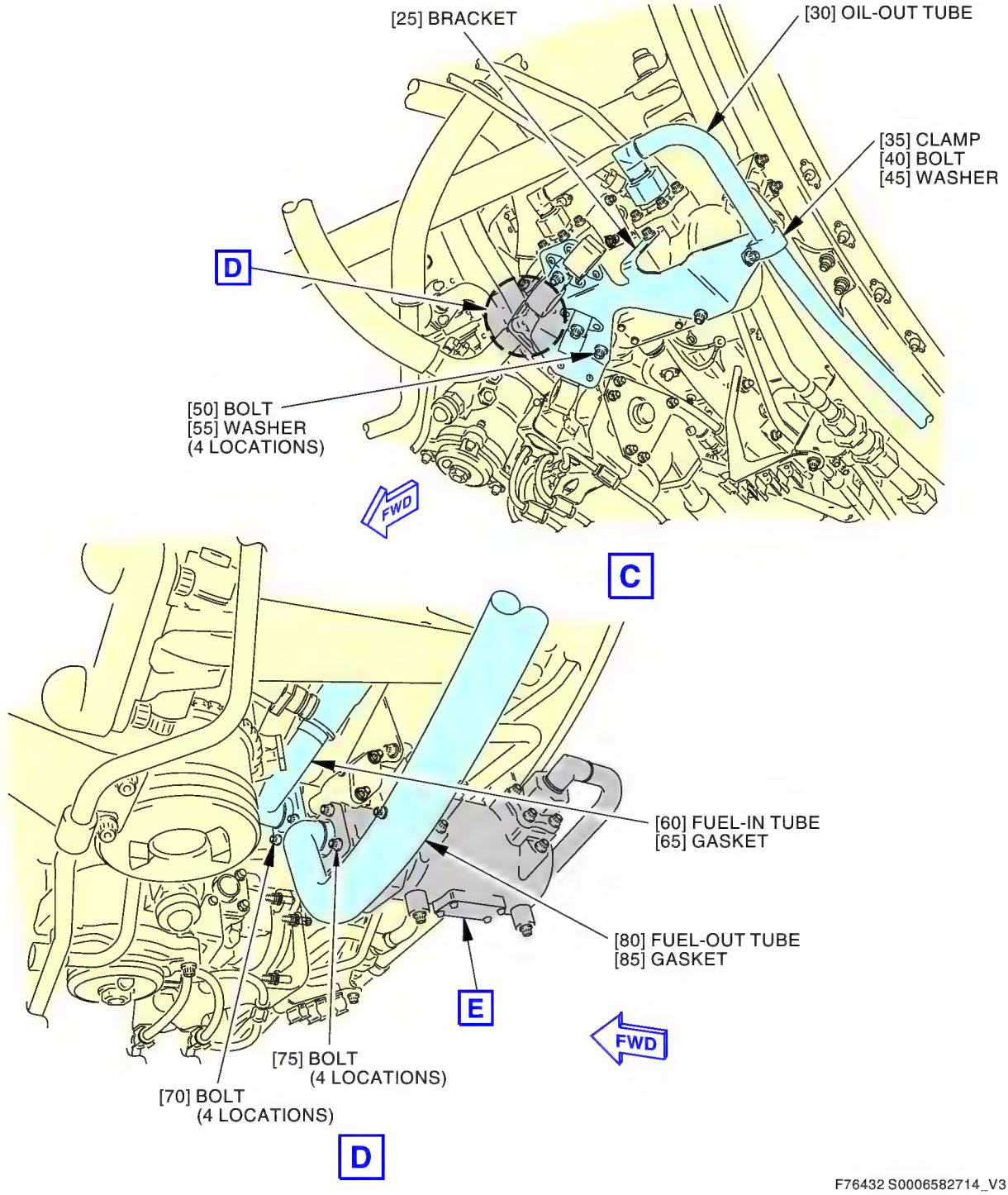
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



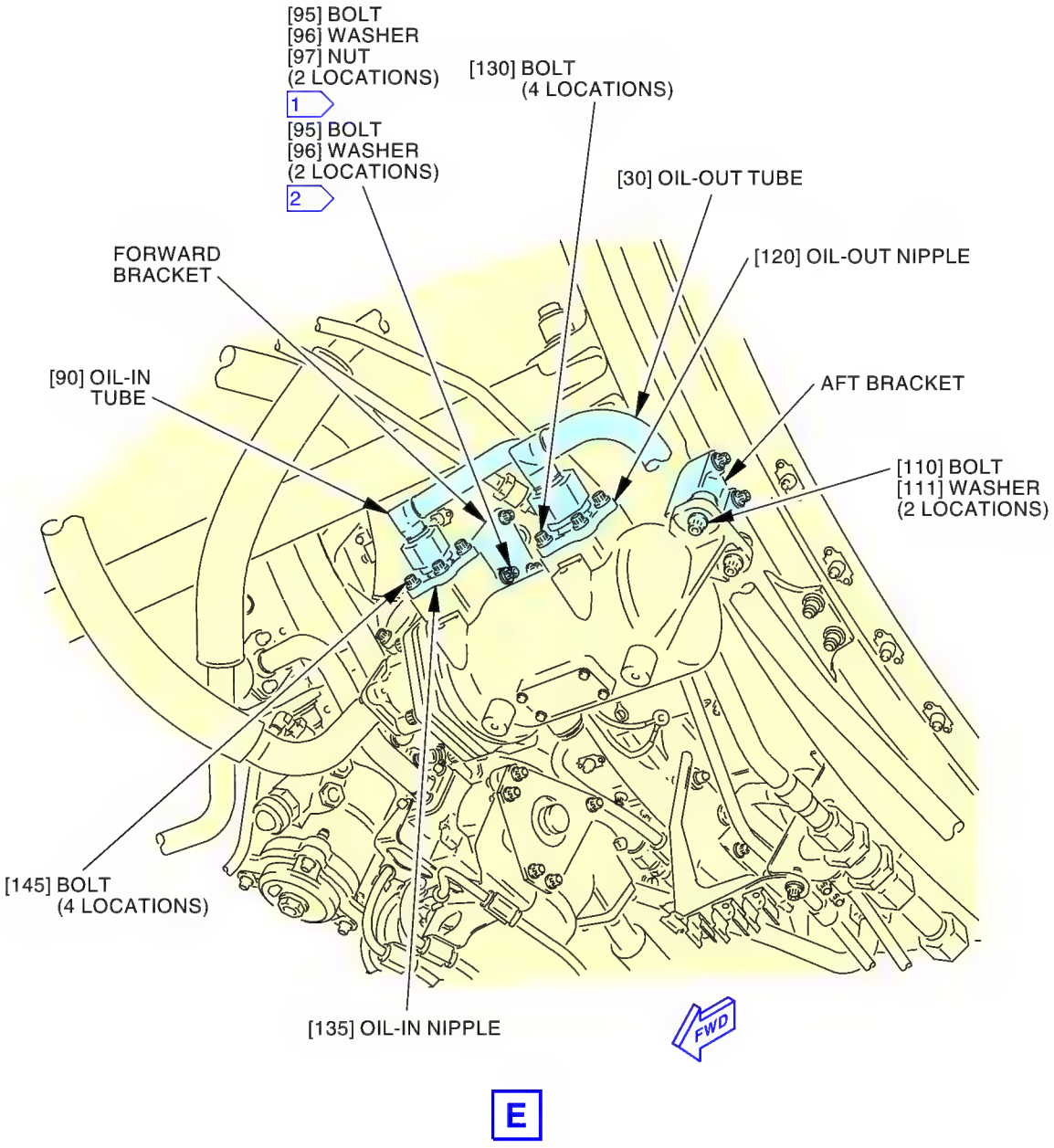
IDG Oil Cooler Installation
Figure 401/73-11-06-990-801-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



IDG Oil Cooler Installation
Figure 401/73-11-06-990-801-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



1 IDG OIL COOLER FORWARD BRACKET PRE-CFMI-SB 72-040
2 IDG OIL COOLER FORWARD BRACKET POST-CFMI-SB 72-040

H34152 S0006582715_V3

IDG Oil Cooler Installation
Figure 401/73-11-06-990-801-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-06-400-801-F00

3. IDG Oil Cooler Installation

(Figure 401)

A. References

Reference	Title
12-13-21-600-801	IDG Servicing (Oil Fill) (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Cooler	73-11-06-01-145	IDC 001-006
		73-11-06-01A-175	IDC 007-010, 012-999
15	O-ring	73-11-06-01-140	IDC 001-006
		73-11-06-01A-170	IDC 007-010, 012-999
65	Gasket	73-11-00-02-262	IDC 001-006
		73-11-00-02A-315	IDC 007-010, 012-999
85	Gasket	73-11-00-02-262	IDC 001-006
		73-11-00-02A-315	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Installation

SUBTASK 73-11-06-840-002-F00

(1) Prepare for the procedure as follows:

(a) Remove the protective covers from the IDG oil cooler [5] and its oil and fuel tubes.

(b) Make sure that the mating surfaces of the IDG oil cooler [5] are clean.

(c) Examine all of the component mating surfaces and the adjacent areas.

1) Make sure that the mating surfaces are clean.

2) Make sure that the components are not damaged.

(d) Re-install the protective covers on the IDG oil cooler [5] and its oil and fuel tubes.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-06-420-002-F00

(2) Install the drain plug [20] into the IDG oil cooler [5]:

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(a) Lubricate the new O-ring [15] with oil, D00623 [CP5066].

(b) Install the new O-ring [15] on the drain plug [20].

(c) Lubricate the threads of the drain plug [20] with oil, D00623 [CP5066].

(d) Install the drain plug [20].

1) Tighten the drain plug [20] to a torque of 45 in-lb (5.08 N·m) - 55 in-lb (6.21 N·m).

(e) Install the safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [20].

SUBTASK 73-11-06-020-008-F00

(3) Install the oil-out nipple [120] and the oil-in nipple [135] on the IDG oil cooler [5]:

(a) Remove the protective covers from the oil-out nipple [120], the oil-in nipple [135], and the oil ports on the IDG oil cooler [5].

(b) Lubricate the threads of bolts [130] and bolts [145] with graphite mineral vaseline, D00601 [CP2101].

(c) Put the oil-out nipple [120] in the correct position on the IDG oil cooler [5].

1) Install the bolts [130] to attach the oil-out nipple [120] to the IDG oil cooler [5].

2) Tighten the bolts [130] to 49 in-lb (5.54 N·m) - 53 in-lb (5.99 N·m).

(d) Put the oil-in nipple [135] in the correct position on the IDG oil cooler [5].

1) Install the bolts [145] to attach the oil-in nipple [135] to the IDG oil cooler [5].

2) Tighten the bolts [145] to 49 in-lb (5.54 N·m) - 53 in-lb (5.99 N·m).

F. IDG Oil Cooler Installation

SUBTASK 73-11-06-420-003-F00

(1) Install the IDG oil cooler [5] on the engine as follows:

(a) Lubricate the threads of the bolts [95] and bolts [110] with graphite mineral vaseline, D00601 [CP2101].

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(b) Lubricate the threads of nipple [120] and nipple [135] with oil, D00623 [CP5066].

(c) Put the IDG oil cooler [5] in the correct position on the engine.

1) Connect the oil-in tube [90] to the oil-in nipple [135].

a) Do not tighten the coupling nut at this time.

2) Connect the oil-out tube [30] to the oil-out nipple [120].

a) Do not tighten the coupling nut at this time.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL PRE SB CFM56-7B-72-040

(d) Loosely install the bolts [95], washers [96], and nuts [97] to attach the IDG oil cooler [5] to the forward bracket.

IDC ALL POST SB CFM56-7B-72-040

(e) Loosely install the bolts [95] and washers [96] to attach the IDG oil cooler [5] to the forward bracket.

IDC ALL

(f) Install the bolts [110] and washers [111] to attach the IDG oil cooler [5] to the aft bracket.

(g) Make sure that the IDG oil cooler [5] is in its correct position.

1) Tighten the bolts [110] to 98 in-lb (11.07 N·m) - 110 in-lb (12.43 N·m).

IDC ALL PRE SB CFM56-7B-72-040

2) Tighten the nuts [97] to 98 in-lb (11.07 N·m) - 110 in-lb (12.43 N·m).

IDC ALL POST SB CFM56-7B-72-040

3) Tighten the bolts [95] to 98 in-lb (11.07 N·m) - 110 in-lb (12.43 N·m).

IDC ALL

SUBTASK 73-11-06-420-004-F00

(2) Install the fuel-in tube [60] and fuel-out tube [80] to the forward end of the IDG oil cooler [5]:

(a) Remove the protective covers from the fuel-in tube [60], the fuel-out tube [80], and the fuel ports in the forward end of the IDG oil cooler [5].

WARNING DO NOT LET THE OIL STAY ON YOUR SKIN. USE THE OIL IN AN AREA WITH GOOD AIRFLOW. THE OIL IS POISONOUS AND YOUR SKIN CAN ABSORB THE OIL. THE OIL FUMES CAN CAUSE INJURY.

(b) Lubricate the gasket [65] and gasket [85] with oil, D00623 [CP5066].

(c) Lubricate the threads of bolts [70] and bolts [75] with graphite mineral vaseline, D00601 [CP2101].

(d) Put the gasket [65] and the fuel-in tube [60] in the correct position on the IDG oil cooler [5].

1) Install the bolts [70] to attach the fuel-in tube [60] and the gasket [65] to the IDG oil cooler [5].

2) Tighten the bolts [70] to 49 in-lb (5.54 N·m) - 53 in-lb (5.99 N·m).

(e) Put the gasket [85] and the fuel-out tube [80] in the correct position on the IDG oil cooler [5].

1) Install the bolts [75] to attach the fuel-out tube [80] and the gasket [85] to the IDG oil cooler [5].

2) Tighten the bolts [75] to 49 in-lb (5.54 N·m) - 53 in-lb (5.99 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-06-420-005-F00

CAUTION: MAKE SURE THAT YOU USE TWO WRENCHES TO TIGHTEN TUBE COUPLING NUTS. ONE WRENCH TO HOLD THE FITTING AND THE SECOND WRENCH TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(3) Tighten the coupling nuts on the oil tubes:

(a) Tighten the coupling nut on the oil-out tube [30] to 900 in-lb (101.69 N·m) - 1100 in-lb (124.28 N·m).

(b) Tighten the coupling nut on the oil-in tube [90] to 650 in-lb (73.44 N·m) - 770 in-lb (87.00 N·m).

SUBTASK 73-11-06-020-009-F00

(4) Install the bracket [25] as follows:

(a) Lubricate the threads of bolt [40] and bolts [50] with graphite mineral vaseline, D00601 [CP2101].

(b) Install the bolts [50] and washers [55] to attach the bracket [25] to the IDG oil cooler [5].

1) Tighten the bolts [50] to 98 in-lb (11.07 N·m) - 110 in-lb (12.43 N·m).

(c) Install the bolt [40], washer [45], and clamp [35] to attach the oil-out tube [30] to the bracket [25].

1) Tighten the bolt [40] to 49 in-lb (5.54 N·m) - 53 in-lb (5.99 N·m).

SUBTASK 73-11-06-420-001-F00

(5) Put the J5, J6, J7 and J8 harnesses in the 1/4-turn Omega clamps [10].

(a) Close the 1/4-turn Omega clamps [10].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 73-11-06-730-001-F00

(1) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

(2) Remove the DO-NOT-OPERATE tag from the applicable engine start lever.

(3) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(a) Remove the DO-NOT-OPERATE tag from the BAT switch on P5-13 panel.

(5) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SERVO FUEL HEATER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the servo fuel heater

(2) The installation of the servo fuel heater.

TASK 73-11-07-000-801-F00

2. Servo Fuel Heater Removal

(Figure 401)

A. General

(1) The servo fuel heater is on the engine, below the left fan cowl panel, at the 8:00 o'clock position.

(2) The servo fuel heater is installed on the top of the fuel pump package, adjacent to the main oil/fuel heat exchanger.

(3) The servo fuel heater is attached to the Hydro-Mechanical Unit (HMU) and the main oil/fuel heat exchanger.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Plug	73-11-01-01-060	IDC 001-006
		73-11-01-01A-110	IDC 007-010, 012-999
4	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

Zone	Area
421	Engine 2 - Engine

G. Prepare for Removal

SUBTASK 73-11-07-840-001-F00

(1) Do these steps to prepare the airplane for the removal:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure that the applicable start lever is in the CUTOFF position and install a DO-NOT-OPERATE tag.

(c) Make sure that the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions:

- Bright when the valve is in transition or does not agree with the commanded position
- Dim when the valve is closed
- Off when the valve is opened.

(d) Make sure that the SPAR VALVE CLOSED light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the spar shutoff valve has three positions:

- Bright when the valve is in transition or does not agree with the commanded position
- Dim when the valve is closed
- Off when the valve is opened.

(e) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

(f) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. Servo Fuel Heater Removal

SUBTASK 73-11-07-680-001-F00

(1) Do these steps to drain the fuel from the fuel pump [5]:

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054 below the fuel pump.

(b) Remove the drain plug [3] from the fuel filter cover.

(c) Let the fuel drain in the container.

(d) Remove and discard the O-ring [4] from the drain plug [3].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(e) Lubricate a new O-ring [4] with oil, D00623 [CP5066].

(f) Install a new O-ring [4] on the drain plug [3].

(g) Lubricate the threads of the drain plug [3] with oil, D00623 [CP5066].

(h) Install the drain plug [3].

1) Tighten the drain plug to a torque of 45-55 pound-inches (5.0-6.2 Newton meters).

(i) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the drain plug [3].

SUBTASK 73-11-07-210-001-F00

(2) Make sure that the container stays below the fuel pump during the removal procedure.

(a) As you disassemble the servo fuel heater [1], let the unwanted fuel and oil drain into the container.

SUBTASK 73-11-07-020-001-F00

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED ENGINE CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON GOGGLES AND OTHER EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

WARNING DO NOT LET ENGINE OIL STAY ON YOUR SKIN. USE ENGINE OIL IN AN AREA WITH GOOD VENTILATION. ENGINE OIL IS POISONOUS AND CAN BE ABSORBED THROUGH YOUR SKIN. ENGINE OIL FUMES CAN IRRITATE YOUR RESPIRATORY TRACT.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

CAUTION USE TWO WRENCHES TO LOOSEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(3) Do these steps to remove the oil tube [11] from the servo fuel heater [1]:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the nut [15], the bolt [16] and the clamp [17] that hold the oil tube [11] on the bracket.

NOTE: The nut [15] and the bolt [16] also hold a clamp for the fuel tube [14].

1) Let the other clamp stay on the fuel tube [14].

(b) Remove the nut [18], the bolt [19] and the clamp [20] that hold the oil tube [11] on the bracket.

(c) Use two wrenches to disconnect the oil tube [11] from the oil tube [10].

(d) Remove the four bolts [13] that hold the oil tube [11] and the gasket [12] on the servo fuel heater [1].

1) If the gasket [12] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to TASK 70-30-01-910-802-F00 for gasket and seal maintenance practices.

2) Remove the oil tube [11].

a) Install protective covers on the oil tube [11], the oil tube [10] and the servo fuel heater [1].

SUBTASK 73-11-07-010-001-F00

(4) Do these steps to remove the fuel tube [21] from the HMU [2]:

(a) Remove the nut [18], the bolt [19] and the clamp [20] that hold the fuel tube [21] on the bracket.

(b) Use two wrenches to disconnect the fuel tube [21] from the fuel tube [22].

(c) Remove the four bolts [24] that hold the fuel tube [21] and gasket [23] on the HMU [2].

1) If the gasket [23] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to TASK 70-30-01-910-802-F00 for gasket and seal maintenance practices.

2) Remove the fuel tube [21].

a) Install protective covers on the fuel tube [21], the fuel tube [22] and the HMU [2].

SUBTASK 73-11-07-020-002-F00

(5) Do these steps to disconnect the oil tube [27] from the servo fuel heater [1]:

(a) Remove the four bolts [26] that hold the oil tube [27] and the gasket [25] on the servo fuel heater [1].

1) Move the oil tube [27] out of the way, to make sure that it is not damaged.

a) If necessary, use string or tape to keep the tube out of the way.

2) If the gasket [25] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to TASK 70-30-01-910-802-F00 for gasket and seal maintenance practices.

a) Install protective covers on the oil tube [27] and the servo fuel heater [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-07-020-003-F00

CAUTION: USE TWO WRENCHES TO LOOSEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(6) Do these steps to remove the fuel tube [30] and the fuel tube [31] from the servo fuel heater [1]:

(a) Use two wrenches to disconnect the fuel tube [30] from the servo fuel heater and the fuel pump.

1) Remove the fuel tube [30].

2) Install protective covers on the fuel tube [30], the servo fuel heater, and the fuel pump.

(b) Use two wrenches to disconnect the fuel tube [31] from the servo fuel heater.

(c) Remove the four bolts [32] that hold the fuel tube [31] and the gasket [33] on the HMU [2].

1) Remove the fuel tube [31].

a) If the gasket [33] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to TASK 70-30-01-910-802-F00 for gasket and seal maintenance practices.

2) Install protective covers on the fuel tube [31], the servo fuel heater, and the HMU [2].

SUBTASK 73-11-07-020-004-F00

(7) Do these steps to remove the servo fuel heater [1]:

(a) Remove the nut [45], the bolt [46] and the clamp [47] that hold the fuel tube [14] on the bracket [44].

(b) Remove the three nuts [42] that hold the servo fuel heater [1] and the bracket [44] on the outboard side of the main oil/fuel heat exchanger [40].

(c) Remove the three nuts [42] and washers [43] that hold the servo fuel heater [1] on the inboard side of the main oil/fuel heat exchanger [40].

(d) Carefully remove the servo fuel heater [1], the bracket [44] and the gasket [41] from the main oil/fuel heat exchanger [40].

1) If the gasket [41] is serviceable, then keep it with the servo fuel heater for the subsequent installation.

NOTE: Refer to TASK 70-30-01-910-802-F00 for gasket and seal maintenance practices.

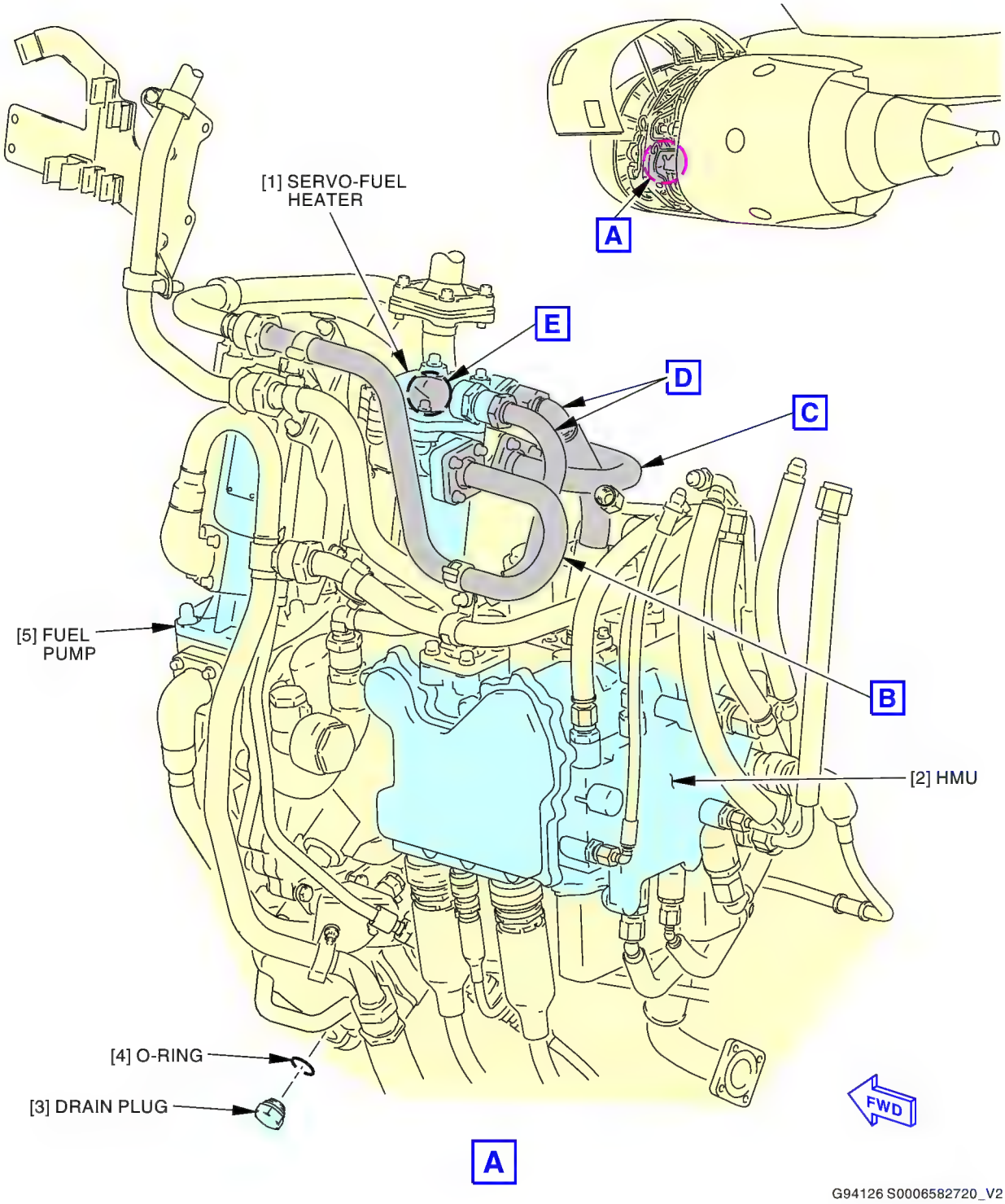
2) Remove the two nipples [48].

a) Remove and discard the O-rings [49] from the nipples [48].

3) Install protective covers on the main oil/fuel heat exchanger [40] and the servo fuel heater [1].

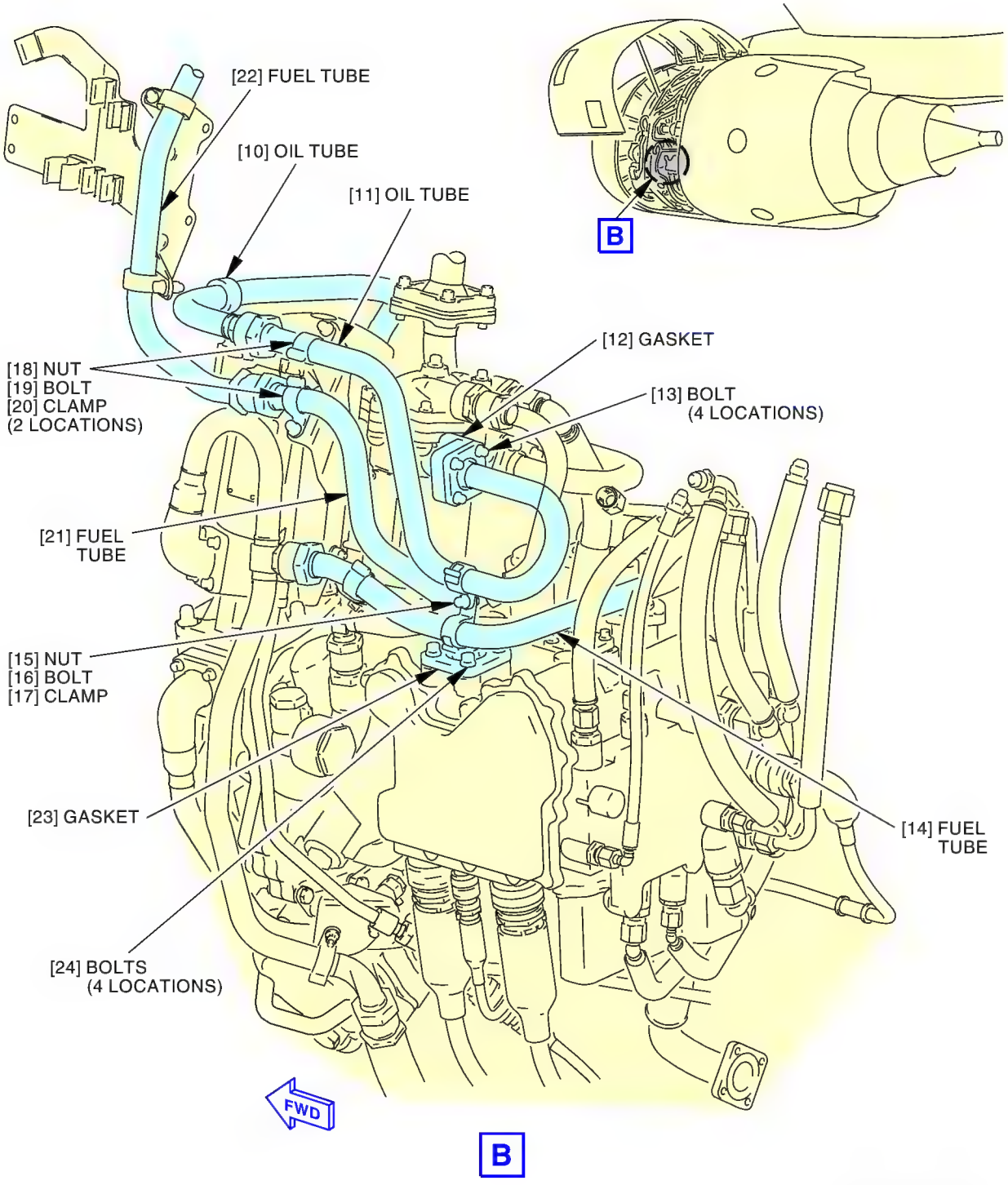
END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



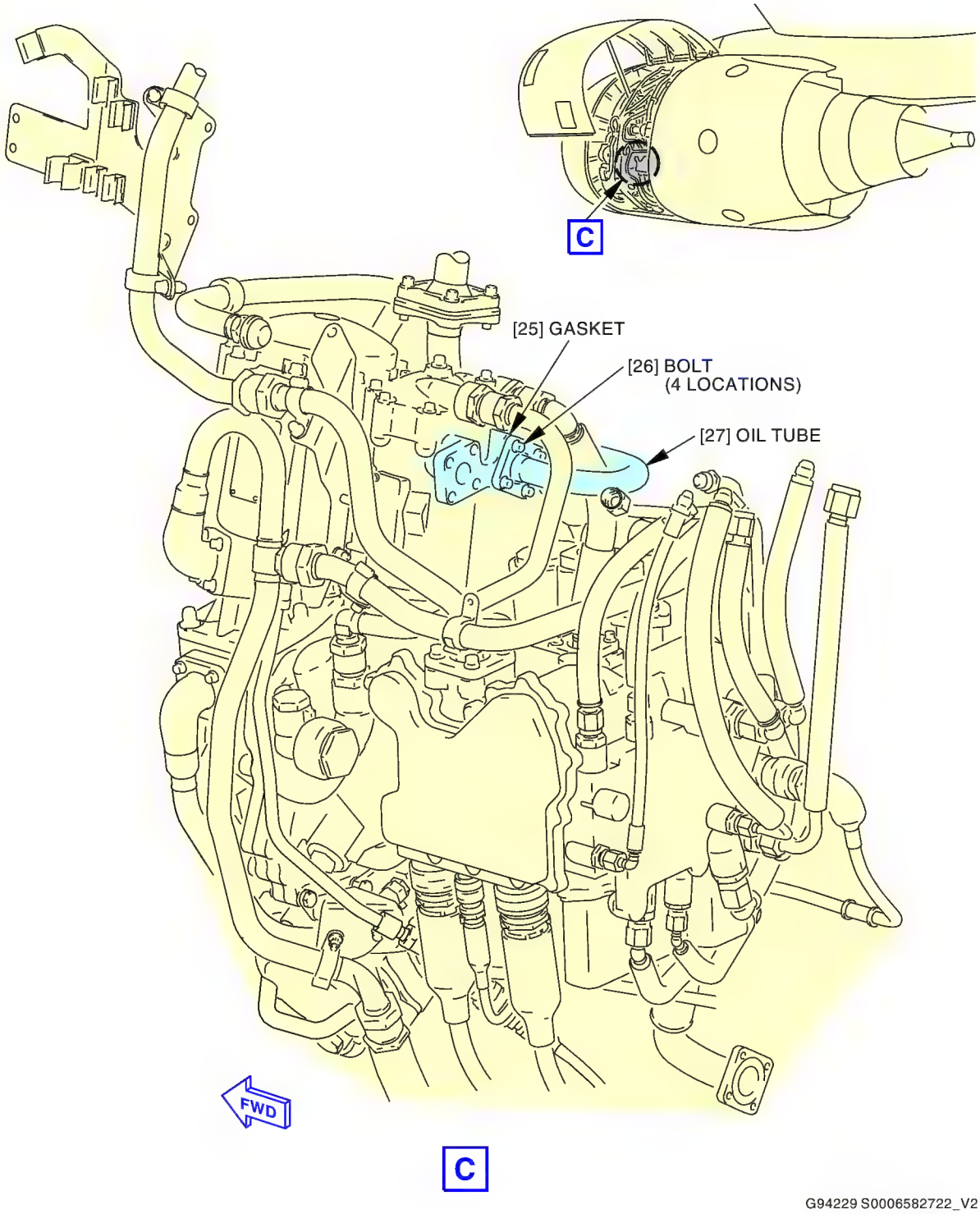
Servo-Fuel Heater Installation
Figure 401/73-11-07-990-801-F00 (Sheet 1 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



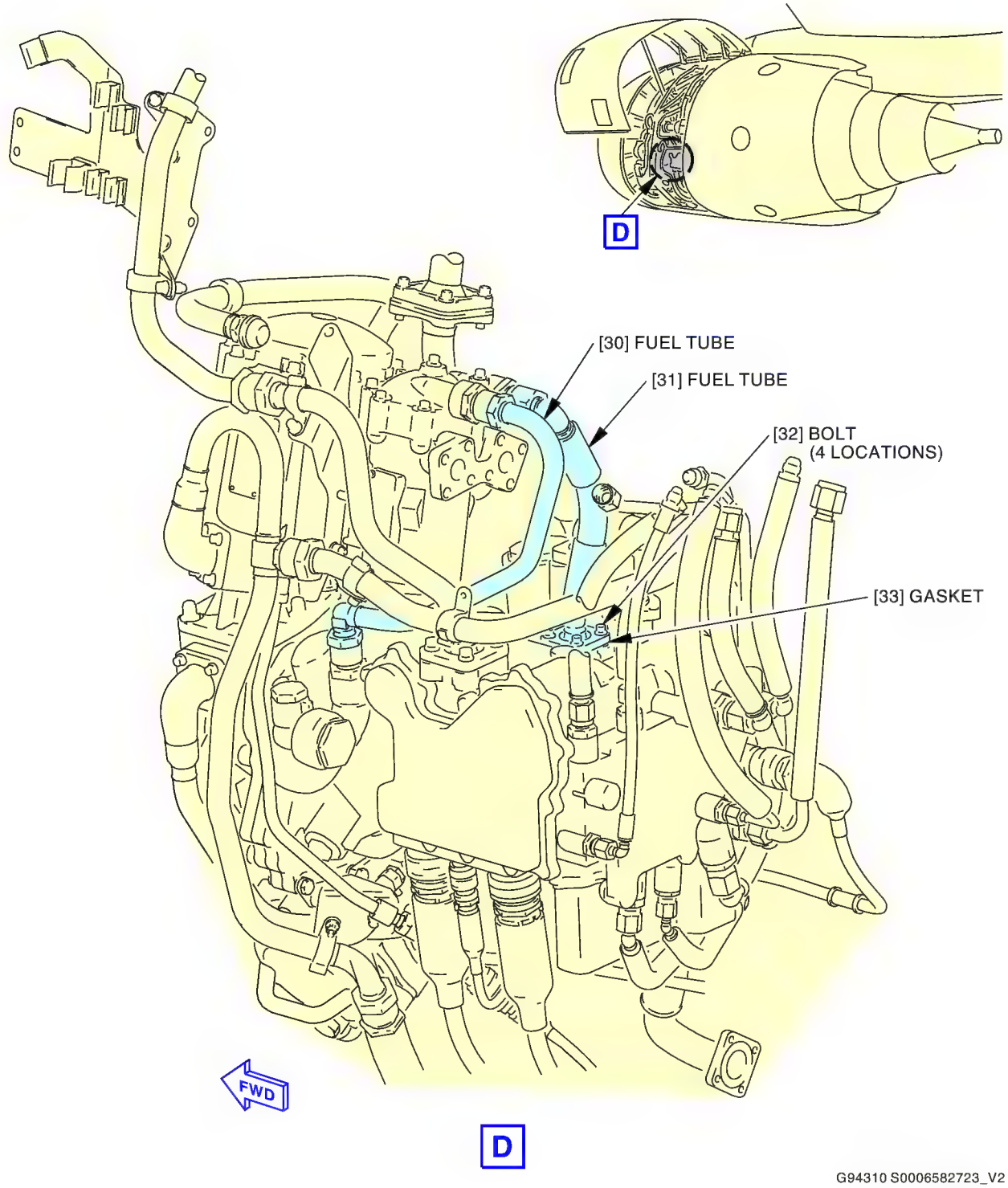
Servo-Fuel Heater Installation
Figure 401/73-11-07-990-801-F00 (Sheet 2 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



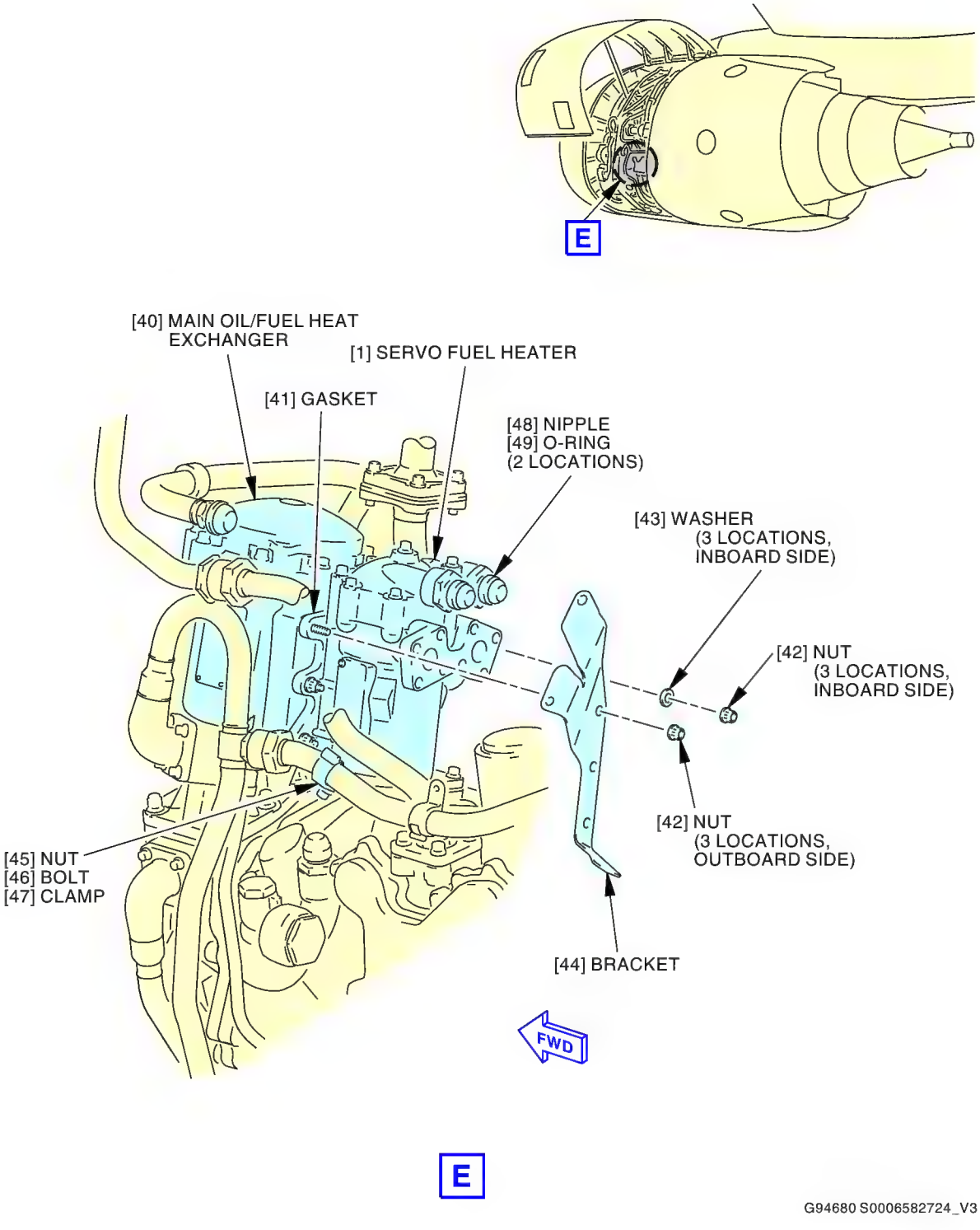
Servo-Fuel Heater Installation
Figure 401/73-11-07-990-801-F00 (Sheet 3 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Servo-Fuel Heater Installation
Figure 401/73-11-07-990-801-F00 (Sheet 4 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Servo-Fuel Heater Installation
Figure 401/73-11-07-990-801-F00 (Sheet 5 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-07-400-801-F00

3. Servo Fuel Heater Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Heater	79-21-02-01-225	IDC 001-006
		79-21-02-01A-070	IDC 007-010, 012-999
12	Gasket	79-21-00-01-092	IDC 001-006
		79-21-00-01-120	IDC 001-006
		79-21-00-01A-180	IDC 007-010, 012-999
		79-21-00-01A-210	IDC 007-010, 012-999
23	Gasket	73-11-00-02-100	IDC 001-006
		73-11-00-02A-155	IDC 007-010, 012-999
25	Gasket	79-21-00-01-065	IDC 001-006
		79-21-00-01A-145	IDC 007-010, 012-999
33	Gasket	73-11-00-02-125	IDC 001-006
		73-11-00-02A-170	IDC 007-010, 012-999
41	Gasket	79-21-02-01-210	IDC 001-006
		79-21-02-01A-060	IDC 007-010, 012-999
49	O-ring	73-11-00-02-140	IDC 001-006
		73-11-00-02A-185	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Procedure

SUBTASK 73-11-07-020-005-F00

(1) Install the servo fuel heater [1] on the main oil/fuel heat exchanger [40].

(a) Remove the protective covers from the mating surfaces of the main oil/fuel heat exchanger [40] and the servo fuel heater [1].

(b) Lubricate the applicable parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [41] with oil, D00623 [CP5066].

2) Lubricate the threads of the studs on the main oil/fuel heat exchanger [40] with graphite mineral vaseline, D00601 [CP2101].

(c) Put the gasket [41], the servo fuel heater [1], and the bracket [44] in the correct position on the main oil/fuel heat exchanger [40].

(d) Install the three nuts [42] that hold the servo fuel heater [1] and the bracket [44] on the outboard side of the main oil/fuel heat exchanger [40].

(e) Install the three nuts [42] and the three washers [43] that hold the servo fuel heater [1] on the inboard side of the main oil/fuel heat exchanger [40].

1) Torque the six nuts [42] to 98 in-lb (11 N·m) - 110 in-lb (12 N·m) in a criss-cross pattern.

(f) Install the nut [45], the bolt [46] and the clamp [47] that hold the fuel tube [14] on the bracket [44].

1) Torque the nut [45] to 98 in-lb (11 N·m) - 110 in-lb (12 N·m).

SUBTASK 73-11-07-420-001-F00

(2) Do these steps to install the two nipples [48]:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(a) Lubricate two new O-rings [49] with oil, D00623 [CP5066].

(b) Install one O-ring [49] in the groove of each nipple [48].

(c) Lubricate the threads of the two nipples [48] with oil, D00623 [CP5066].

(d) Install the two nipples [48] in the servo fuel-heater ports.

(e) Torque the two nipples [48] to 361 in-lb (41 N·m) - 399 in-lb (45 N·m).

(f) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], between the two nipples [48].

SUBTASK 73-11-07-020-006-F00

CAUTION DO NOT APPLY TOO MUCH BENDING LOAD ON THE FUEL TUBE WHEN YOU INSTALL IT. TOO MUCH BENDING CAN CAUSE DAMAGE TO THE PART.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(CAUTION PRECEDES)

CAUTION USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(3) Do these steps to install the fuel tube [30] and the fuel tube [31] on the servo fuel heater [1]:

(a) Remove the protective covers from the fuel tube [30] and the fuel tube [31].

(b) Remove the applicable protective covers from the servo fuel heater [1], the HMU [2], and the fuel pump [5].

(c) Lubricate the applicable parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [33] with oil, D00623 [CP5066].

2) Lubricate the threads of the four bolts [32] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the two nipples [48] with oil, D00623 [CP5066].

(d) Put the fuel tube [30] in the correct position between the servo fuel heater [1] and the fuel pump [5].

(e) Use your hands to connect the fuel tube [30] to the servo fuel heater [1] and the fuel pump [5].

(f) Use two wrenches to torque the coupling nut between the fuel tube [30] and the fuel pump [5] to 650 in-lb (73 N·m) - 770 in-lb (87 N·m).

(g) Use two wrenches to torque the coupling nut between the fuel tube [30] and the servo fuel heater [1] to 650 in-lb (73 N·m) - 770 in-lb (87 N·m).

(h) Put the fuel tube [31] and the gasket [33] in the correct position between the servo fuel heater [1] and the HMU [2].

(i) Use your hand to connect the fuel tube [31] to the servo fuel heater [1].

(j) Install the four bolts [32] that hold the fuel tube [31] and the gasket [33] on the servo fuel heater [1].

1) Torque the four bolts [32] to 49 in-lb (6 N·m) - 53 in-lb (6 N·m).

(k) Use two wrenches to torque the coupling nut between the fuel tube [31] and the servo fuel heater [1] to 650 in-lb (73 N·m) - 770 in-lb (87 N·m).

SUBTASK 73-11-07-020-007-F00

CAUTION MAKE SURE THAT THERE IS A CLEARANCE BETWEEN THE OIL TUBE AND ADJACENT PARTS AFTER INSTALLATION. THIS WILL PREVENT DAMAGE ON FAN FRAME SHROUD SKIN.

(4) Do these steps to connect the oil tube [27] to the servo fuel heater [1]:

(a) Remove the protective cover from the oil tube [27].

(b) Remove the applicable protective cover from the servo fuel heater [1].

(c) Lubricate the applicable parts:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [25] with oil, D00623 [CP5066].
2) Lubricate the threads of the four bolts [26] with graphite mineral vaseline, D00601 [CP2101].

(d) Put the oil tube [27] and the gasket [25] in the correct position on the servo fuel heater.

(e) Install the four bolts [26] that hold the oil tube [27] and the gasket [25] on the servo fuel heater [1].

1) Torque the four bolts [26] to 49 in-lb (6 N·m) - 53 in-lb (6 N·m).

SUBTASK 73-11-07-410-001-F00

CAUTION USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(5) Do these steps to install the fuel tube [21] on the HMU [2] and on the fuel tube [22]:

(a) Remove the protective covers from the fuel tube [21], the fuel tube [22] and the HMU [2].

(b) Lubricate the applicable parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE SKIN.

1) Lubricate the threads of the bolts [19] and the bolts [24] with graphite mineral vaseline, D00601 [CP2101].
2) Lubricate the threads of the fuel tube [21] and the fuel tube [22] with oil, D00623 [CP5066].
3) Lubricate the gasket [23] with vaseline, D00672 [CP5070].

(c) Put the fuel tube [21] and gasket [23] in the correct position between the fuel tube [22] and the HMU [2].

(d) Use your hand to install the four bolts [24] that hold the fuel tube [21] and the gasket [23] on the HMU [2].

(e) Use your hands to connect the fuel tube [21] to the fuel tube [22].

(f) Make sure that the fuel tube [21] is in its correct position.

(g) Use your hands to install the nut [18], the bolt [19] and the clamp [20] that hold the fuel tube [21] on the bracket.

(h) Torque the four bolts [24] to 97 in-lb (11 N·m) - 110 in-lb (12 N·m).

(i) Use two wrenches to torque the coupling nut between the fuel tube [21] and the fuel tube [22] to 900 in-lb (102 N·m) - 1000 in-lb (113 N·m).

(j) Torque the two nuts [18] for the clamps [20] to 98 in-lb (11 N·m) - 110 in-lb (12 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-11-07-020-008-F00

CAUTION
USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(6) Do these steps to install the oil tube [11] on the servo fuel heater [1]:

(a) Remove the protective covers from the oil tube [11], the oil tube [10], and the servo fuel heater [1].

(b) Lubricate the applicable parts:

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [12] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [13], bolts [16] and bolts [19] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipple of the oil tube [10] with oil, D00623 [CP5066].

4) Lubricate the threads of the oil tube [10] and oil tube [11] with oil, D00623 [CP5066].

(c) Put the oil tube [11] and the gasket [12] in the correct position between the oil tube [10] and the servo fuel heater [1].

(d) Loosely connect the oil tube [11] to the oil tube [10].

(e) Install the four bolts [13] that hold the oil tube [11] and the gasket [12] on the servo fuel heater.

(f) Make sure that the clamp [20] on the oil tube [10] aligns with the bracket [44].

CAUTION
MAKE SURE THAT THE CLAMPS DO NOT INTERFERE WITH THE HMU, THE FUEL TUBES OR THE OIL TUBES. IF INTERFERENCE OCCURS, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(g) Install the nut [15], the bolt [16] and the clamp [17] that hold the oil tube [11] and the fuel tube [14].

(h) Install the nut [18], the bolt [19] and the clamp [20] that hold the oil tube [11] on the bracket [44].

(i) Torque the four bolts [13] to 49 in-lb (6 N·m) - 53 in-lb (6 N·m).

(j) Use two wrenches to torque the coupling nut between the oil tube [11] and oil tube [10] to 900 in-lb (102 N·m) - 1000 in-lb (113 N·m).

(k) Make sure that the oil tube [11] is in its correct position and does not touch other parts of the engine.

(l) Torque the nut [15] and the nut [18] to 98 in-lb (11 N·m) - 110 in-lb (12 N·m).

F. Put the Airplane in Serviceable Condition

SUBTASK 73-11-07-840-002-F00

(1) Do these steps to put the airplane in a serviceable condition:

(a) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the DO-NOT-OPERATE tag from the start lever.

(c) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

G. Servo Fuel-Heater Installation Test

SUBTASK 73-11-07-720-001-F00

(1) Do the tests that are given in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

SUBTASK 73-11-07-720-002-F00



CAUTION

DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(2) If it is necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

BURNER STAGING VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the burner staging valve

(2) The installation of the burner staging valve.

TASK 73-11-08-000-801-F00

2. Burner Staging Valve Removal

(Figure 401)

A. General

(1) The burner staging valve is found on the lower side of engine, forward of the fuel nozzles.

(2) For this procedure the burner staging valve will be referred to as the BSV.

IDC ALL POST SB CFM56-7B-73-054 AND POST SB CFM56-7B 73-44

(3) Engines with CFMI SB 73-044 do not have the Burner Staging Valve installed.

IDC ALL POST SB CFM56-7B-73-054

(4) Engines with CFMI SB 73-054 do not have the Burner Staging Valve installed. The Burner Staging Valve is replaced by a fuel cover.

IDC ALL

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 73-11-08-840-001-F00

(1) Do these steps to prepare for the procedure:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure the engine start lever is in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

WARNING

DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION OF THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THIS ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Burner Staging Valve Removal (BSV)

SUBTASK 73-11-08-020-001-F00

(1) Do these steps to remove the BSV [4] from the engine:

(a) Disconnect the electrical connectors DP0906 [1] and DP1006 [5] from the BSV [4].

(b) Put a 5-gallon (19-liter) fuel resistant container, STD-1054below the BSV [4].

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(c) Remove the four bolts [3] that hold the burner staging valve [4] to the fuel supply manifold.

(d) Remove the BSV [4].

(e) Remove the gasket [2].

(f) Examine the gasket [2] (TASK 70-30-01-910-802-F00).

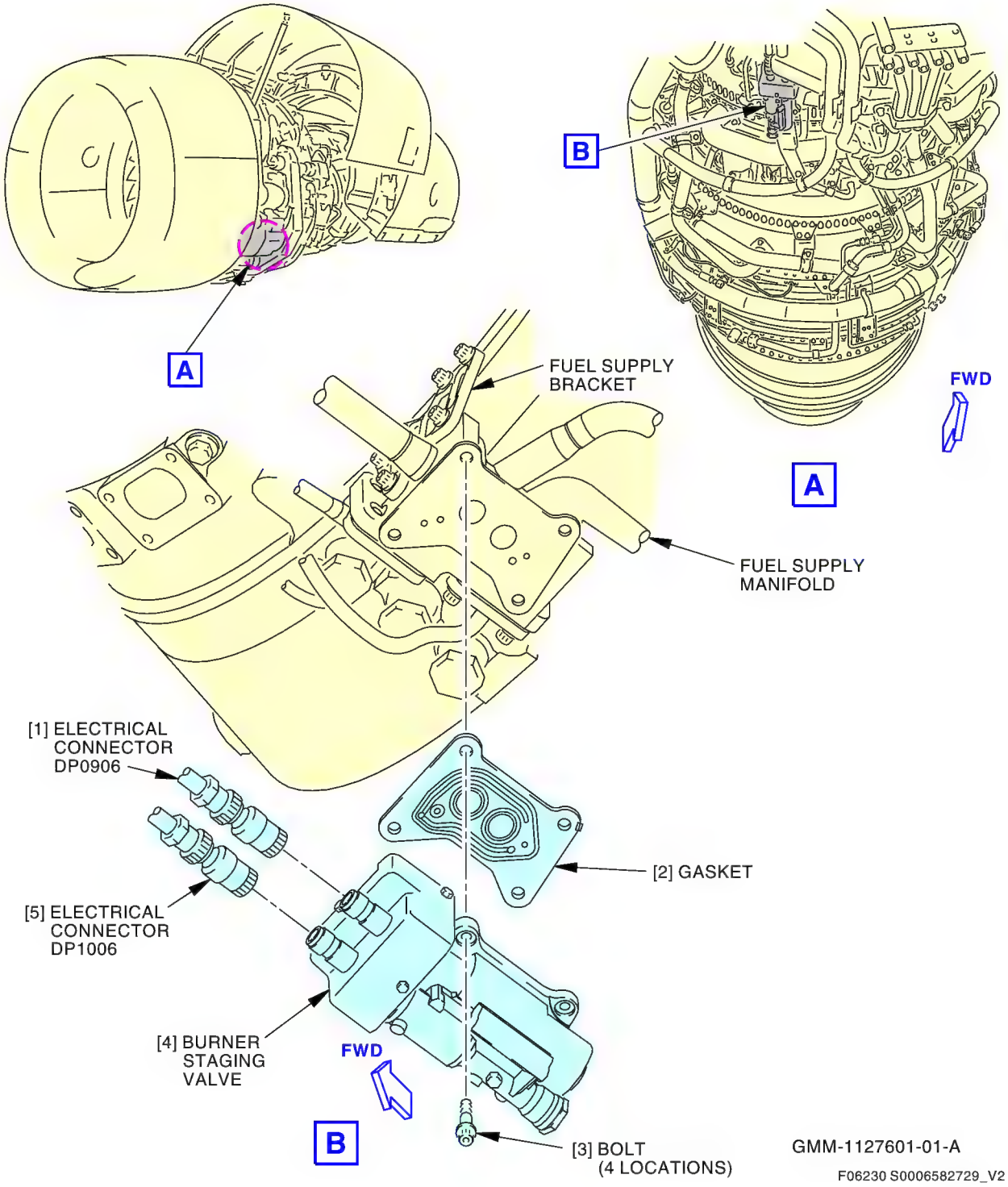
1) If the gasket [2] is damaged, discard the gasket.

2) If there is no damage, keep the gasket [2] for the subsequent installation.

(g) Install protective covers on the BSV [4] openings and the fuel supply manifold.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Burner Staging Valve Installation
Figure 401/73-11-08-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-08-400-801-F00

3. Burner Staging Valve Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Gasket	73-11-00-06A-180	IDC 001-006
		73-11-08-01-020	IDC 001-006
4	Valve	73-11-00-06A-175	IDC 001-006
		73-11-08-01-015	IDC 001-006
		73-11-08-01-045	IDC 001-010, 012-018

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Installation

SUBTASK 73-11-08-840-002-F00

(1) Remove the protective covers from the BSV [4] and the fuel supply manifold.

F. Burner Staging Valve Installation

SUBTASK 73-11-08-420-001-F00

(1) Do these steps to install the BSV [4]:

(a) Put the gasket [2] on the BSV [4].

(b) Lubricate the threads of the bolts [3] with graphite mineral vaseline, D00601 [CP2101].

(c) Use the four bolts [3] to install the burner staging valve [4] on the fuel supply manifold.

1) Tighten the bolts [3] to 55-70 pound-inches (6-8 Newton meters).

(d) Install the electrical connectors DP0906 [1] and DP1006 [5] in the BSV receptacles.

G. Put the Airplane in a Serviceable Condition

SUBTASK 73-11-08-720-001-F00

(1) Do these steps to put the airplane in a serviceable condition:

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER(S). IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

(c) Remove the DO-NOT-OPERATE tag from the engine start lever.

(d) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL SUPPLY HOSE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the fuel supply hose

(2) The installation of the fuel supply hose.

TASK 73-11-10-000-801-F00

2. Fuel Supply Hose Removal

(Figure 401)

A. General

(1) The engine has one fuel supply hose.

(2) The fuel supply hose is between the fuel supply fitting in the strut and the engine fuel tube at the fuel pump package.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Packing	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Removal

SUBTASK 73-11-10-840-001-F00

(1) Do these steps to prepare for the procedure:

(a) Make sure that the engine start lever is in the CUTOFF position.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Install a DO NOT OPERATE tag, STD-858, on the applicable engine start lever.

(b) Make sure that the SPAR VALVE CLOSED light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the spar fuel shutoff valve has three positions: 1) bright when the valve is in transition or does not agree with the commanded position; 2) dim when the valve is closed; or 3) off when the valve is opened.

(c) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO NOT OPERATE tag, STD-858.

(d) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. Fuel Supply Hose Removal

SUBTASK 73-11-10-680-001-F00

(1) Do these steps to drain the fuel from the fuel system:

WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES AND GLOVES WHEN YOU DO FUEL SYSTEM MAINTENANCE. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel pump.

(b) Remove the drain plug [20] from the fuel filter cover.

(c) Let the fuel drain in the container.

(d) Remove and discard the packing [21] from the drain plug.

(e) Keep the container below the engine to catch the unwanted fuel that flows.

WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(f) Lubricate a new packing [21] with oil, D00623 [CP5066].

(g) Install the new packing [21] on the drain plug [20].

(h) Lubricate the threads of the drain plug [20] with oil, D00623 [CP5066].

(i) Install the drain plug [20].

1) Tighten the drain plug [20] to 45 in-lb (5.1 N·m) - 55 in-lb (6.2 N·m).

(j) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [20].

SUBTASK 73-11-10-020-001-F00

(2) Remove the bolts [3] and strap clamps [2] that hold the fuel supply hose [1] to the fan case.

(a) Keep the bolts [3] and strap clamps [2] for the subsequent installation.

SUBTASK 73-11-10-020-002-F00

(3) Do these steps to disconnect the fuel supply hose [1] from the engine fuel tube:

(a) Make sure that the container (5 gal.) is in a position to catch the remaining fuel that can flow from the fuel supply hose [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the bolts [5] that hold the fuel supply hose [1] and the gasket [6] to the engine fuel tube.

1) If the gasket [6] is serviceable, keep it with the tube for the subsequent installation (TASK 70-30-01-910-802-F00).

2) Keep the bolts [5] for the subsequent installation.

SUBTASK 73-11-10-020-004-F00

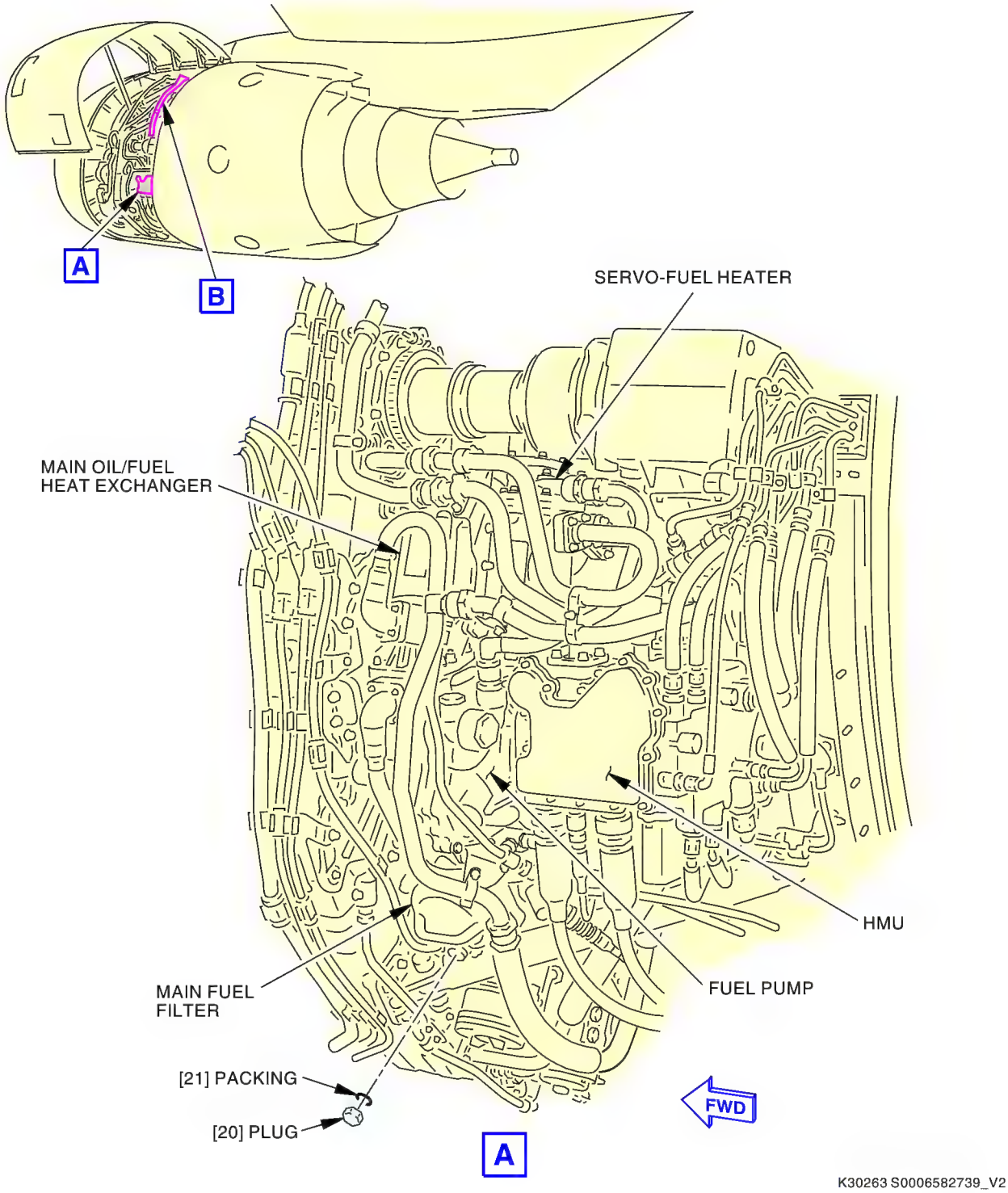
(4) Do these steps to disconnect the fuel supply hose [1] from the strut fitting:

(a) Use two wrenches to disconnect the B-nut from the strut fitting.

NOTE: One wrench to hold the fuel supply hose and one wrench to turn the B-nut.

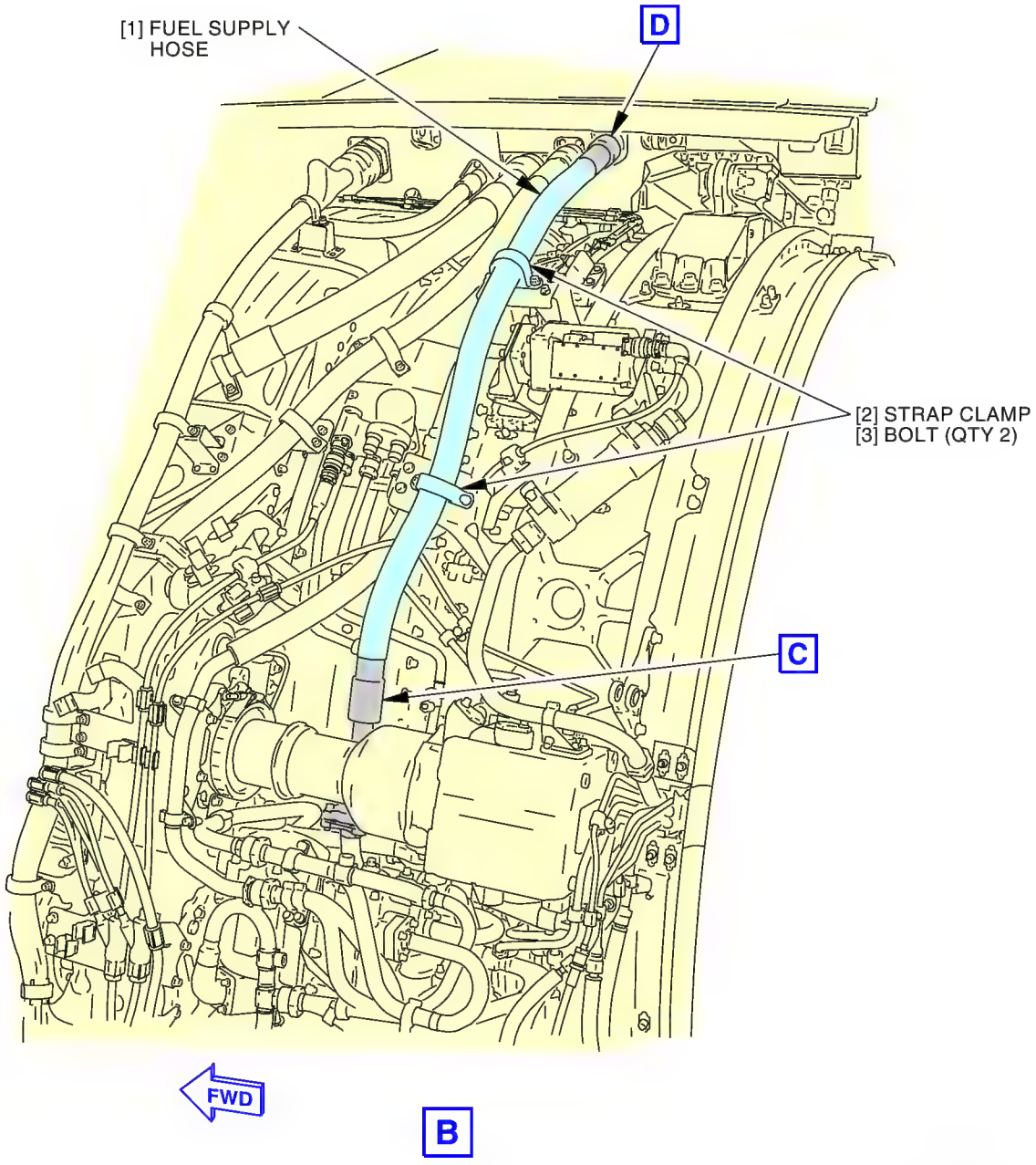
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Supply Hose Installation
Figure 401/73-11-10-990-801-F00 (Sheet 1 of 4)

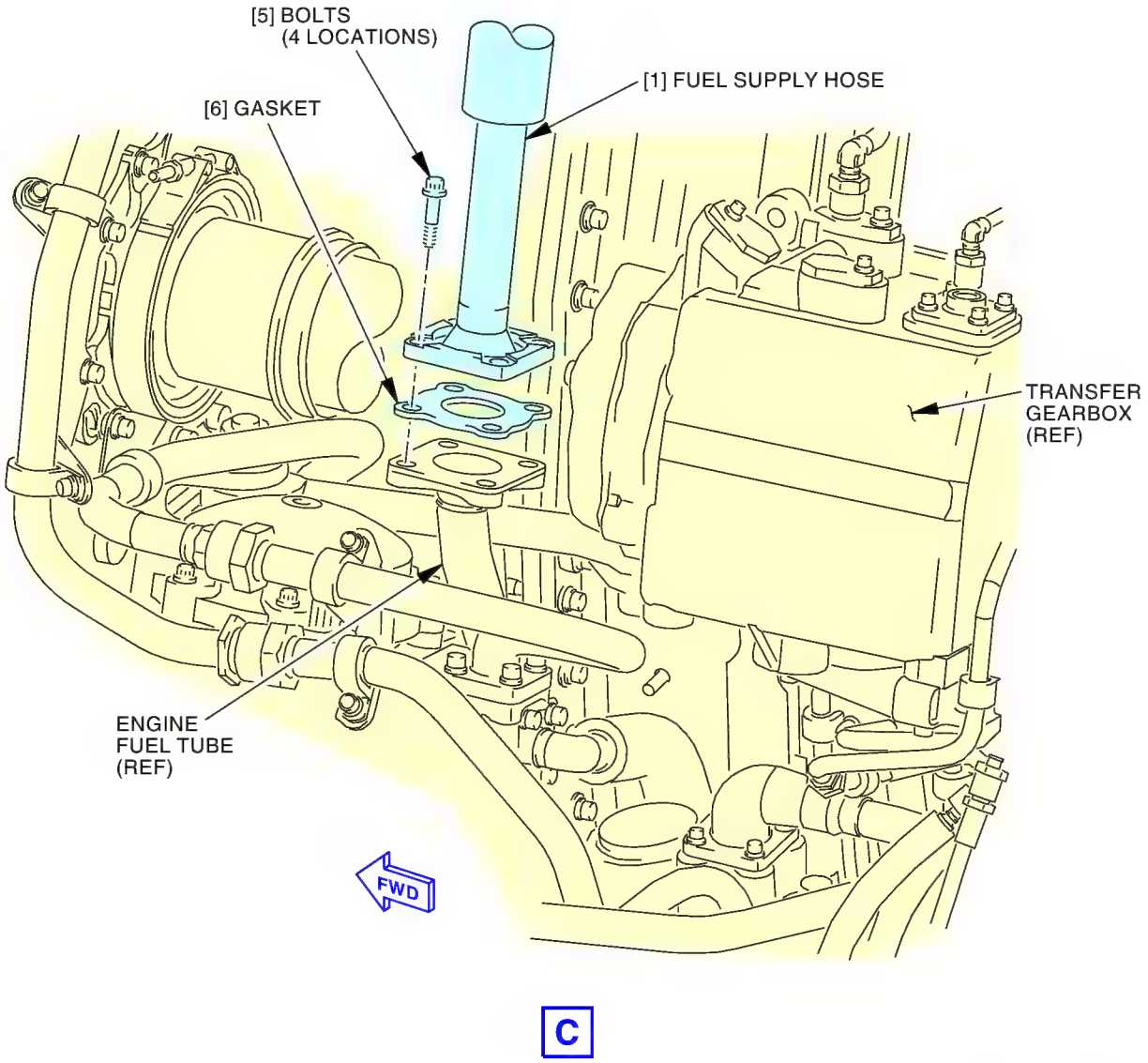
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



N50013 S0006582741_V2

Fuel Supply Hose Installation
Figure 401/73-11-10-990-801-F00 (Sheet 2 of 4)

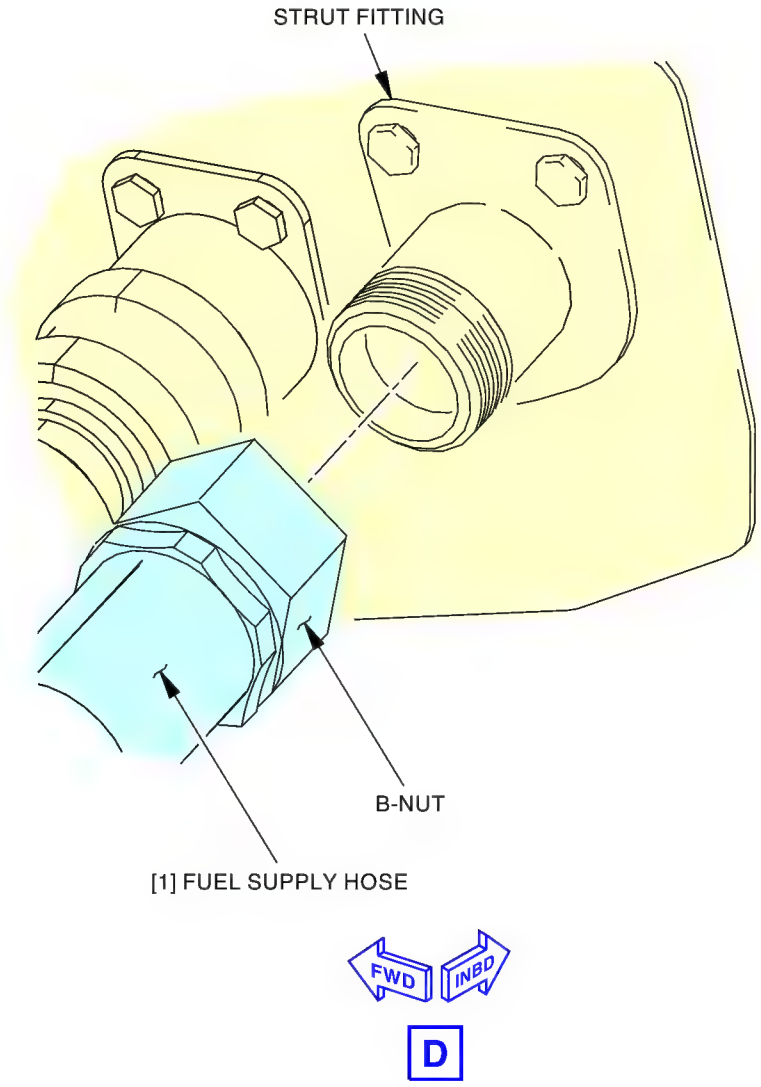
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



H97964 S0006582742_V2

Fuel Supply Hose Installation
Figure 401/73-11-10-990-801-F00 (Sheet 3 of 4)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



L74853 S0006582743_V2

Fuel Supply Hose Installation
Figure 401/73-11-10-990-801-F00 (Sheet 4 of 4)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-10-400-801-F00

3. Fuel Supply Hose Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel supply hose	28-22-51-01A-030	IDC ALL
6	Gasket	28-22-51-01A-020	IDC ALL

E. Fuel Supply Hose Installation

SUBTASK 73-11-10-420-001-F00

(1) Install the fuel supply hose [1] in its correct position on the engine fan case:

(a) Do these steps to connect the fuel supply hose [1] to the strut fitting:

1) Use your hand to connect the B-nut to the strut fitting.

2) Use two wrenches to tighten the B-nut to 1140 in-lb (128.8 N·m) - 1260 in-lb (142.4 N·m).

NOTE: One wrench to hold the fuel supply hose and one wrench to turn the B-nut.

3) Use two wrenches to loosen the B-nut fitting.

4) Use two wrenches to re-tighten the B-nut to a 1140 in-lb (128.8 N·m) to 1260 in-lb (142.4 N·m).

(b) Lubricate the gasket [6] with vaseline, D00672 [CP5070].

(c) Put the fuel supply hose [1] and the gasket [6] in their correct position on the engine fuel tube.

(d) Lubricate the threads of the bolts [5] with Never-Seez NSBT compound, D00006.

(e) Use the bolts [5] to connect the fuel supply hose [1] and the gasket [6] to the engine fuel tube.

1) Tighten the bolts [5] to 50 in-lb (5.6 N·m) - 55 in-lb (6.2 N·m).

(f) Use the strap clamps [2] and the bolts [3] to loosely connect the fuel supply hose [1] to the fan case.

1) Adjust the hose to distribute the hose equally.

2) Tighten the bolts [3] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F. Installation Test

SUBTASK 73-11-10-790-001-F00

(1) Do these steps to prepare for the installation test:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

(b) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

(c) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

(d) Do these steps to apply the boost pump pressure to the fuel pump inlet of the applicable engine:

1) Make sure that the two Engine Start Switches, on the P5 overhead panel, are in the OFF position.

a) Attach DO NOT OPERATE tags, STD-858, to the two Engine Start Switches.

2) For engine 1, do this step:

Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

3) For engine 2, do this step:

Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

4) Move the applicable start lever to the IDLE position.

5) Make sure that the applicable SPAR VALVE CLOSED light, on the P5 overhead panel, comes on bright (valve in transition or when the valve does not agree with the commanded position) and then goes off (valve open).

a) The applicable ENG VALVE CLOSED light will change to bright and not go off because engine fuel pump pressure (N2 turns) is necessary to open the valve.

6) For engine 1, do this step:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

7) For engine 2, do this step:

Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

8) Move the applicable start lever to the CUTOFF position.

(e) For engine 1, do this step:

Put these switches, on the P5 overhead panel, to the ON position:

1) FUEL PUMP 1 FWD
2) FUEL PUMP 1 AFT.

(f) For engine 2, do this step:

Put these switches, on the P5 overhead panel, to the ON position:

1) FUEL PUMP 2 FWD
2) FUEL PUMP 2 AFT.

SUBTASK 73-11-10-210-001-F00

(2) Examine the fittings on the fuel supply hose [1] for leaks.

(a) If you find a leak, then repair the fitting as it is necessary.

(b) If you do not find a leak, then continue.

SUBTASK 73-11-10-840-003-F00

(3) Do these steps to put the airplane in a serviceable condition:

(a) For engine 1, do this step:

Put these switches, on the P5 overhead panel, to the OFF position:

1) FUEL PUMP 1 FWD
2) FUEL PUMP 1 AFT.

(b) For engine 2, do this step:

Put these switches, on the P5 overhead panel, to the OFF position:

1) FUEL PUMP 2 FWD
2) FUEL PUMP 2 AFT.

(c) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

(d) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

(e) Remove the DO-NOT-OPERATE tags from the two Engine Start Switches.

(f) Do this step: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 73-11-10-720-001-F00

CAUTION

DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(4) If it is necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (TASK 71-00-00-700-821-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL PUMP - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the fuel pump.

(2) The installation of the fuel pump.

TASK 73-11-11-000-801-F00

2. Fuel Pump Removal

(Figure 401, Figure 402, Figure 403 and Figure 404).

A. General

(1) This task gives the instructions on how to remove the fuel pump.

(2) The fuel pump is on the engine at the 8:00 o' clock position below the left fan cowl panel.

(3) The fuel pump package is made up of the fuel pump, HMU, fuel filter, main oil/fuel heat exchanger, servo fuel heater, and fuel filter differential pressure switch.

(4) It is easier to complete the procedure if you remove and install the same size tube connectors at the same time.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
72-63-01-000-801-F00	Handcranking Drive Cover Removal (P/B 201)
73-11-01-600-801-F00	Fuel Pump Preservation (P/B 201)
73-11-07-000-801-F00	Servo Fuel Heater Removal (P/B 401)
73-21-10-000-801-F00	HMU Removal (P/B 401)
73-34-01-000-801-F00	Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal (P/B 401)
79-21-02-000-801-F00	Main Oil/Fuel Heat Exchanger Removal (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2189	Block - Jacking, Fuel Pump, MEC/HMU Part #: 856A2609G01 Supplier: 58828
STD-1154	Container - 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

Reference	Description	Specification
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Removal

SUBTASK 73-11-11-840-003-F00

(1) Do these steps to prepare the airplane for the removal:

(a) Make sure that the start levers are in CUTOFF position and install DO-NOT-OPERATE tags.

(b) Make sure that the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions:

1) bright when the valve is in transition or does not agree with the commanded position;

2) dim when the valve is closed; or

3) off when the valve is opened.

(c) Make sure that the SPAR VALVE CLOSED (fuel spar shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

NOTE: The removal of the electrical power is necessary before you disconnect the electrical and fluid connectors. You can reapply electrical power to the airplane after all of the electrical and fluid connectors are disconnected and the protective covers are installed.

(e) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

SUBTASK 73-11-11-010-001-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. Fuel Pump Removal

SUBTASK 73-11-11-680-001-F00

(1) Do these steps to drain the fuel from the fuel pump [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Put a 5 gallon (19 liter) container, STD-1154 below the fuel pump [1].

(b) Cut and discard safety wire from the drain plug [2].

(c) Remove the drain plug [2] from the fuel filter cover.

(d) Let the fuel drain in the container.

(e) Remove and discard the O-ring [3] from the drain plug [2].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(f) Lubricate a new O-ring [3] with oil, D00623 [CP5066].

(g) Install the new O-ring [3] on the drain plug [2].

(h) Lubricate the threads of the drain plug [2] with oil, D00623 [CP5066].

(i) Install the drain plug [2].

1) Tighten the drain plug [2] to torque between 45.0 in-lb (5.08 N·m) to 55.0 in-lb (6.21 N·m).

(j) Install the safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the drain plug [2].

SUBTASK 73-11-11-680-002-F00

(2) Make sure that the container stays below the fuel pump during the removal procedure.

(a) While you disassemble the fuel pump assembly, let the unwanted fuel and oil drain into the container.

SUBTASK 73-11-11-020-001-F00

(3) Do this task: HMU Removal, TASK 73-21-10-000-801-F00.

SUBTASK 73-11-11-020-002-F00

(4) Do this task: Handcranking Drive Cover Removal, TASK 72-63-01-000-801-F00.

SUBTASK 73-11-11-020-003-F00

(5) Do this task: Servo Fuel Heater Removal, TASK 73-11-07-000-801-F00.

SUBTASK 73-11-11-020-004-F00

(6) Do this task: Main Oil/Fuel Heat Exchanger Removal, TASK 79-21-02-000-801-F00.

SUBTASK 73-11-11-020-005-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(7) Do these steps to disconnect the fuel tube [8] from the hose [4]:

(a) Use two wrenches to disconnect the fuel tube [8] from the hose [4].

1) If it is necessary, use lockwire or tape to keep the hose [4] out of the way.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the fuel tube [8].

(c) Install protective covers on the fuel tube [8] and hose [4].

SUBTASK 73-11-11-020-006-F00

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(8) Do these steps to remove the fuel tube [16] from the hose [15] and from the fuel pump [1]:

(a) Use two wrenches to disconnect the fuel tube [16] from the hose [15].

(b) Remove the nut [19], bolt [20] and clamp [21] that hold the fuel tube [16] to the bottom of the fuel pump [1].

(c) Remove the four bolts [18] that hold the fuel tube [16] and the gasket [17] to the fuel pump [1].

(d) Remove the fuel tube [16].

1) If the gasket [17] is serviceable, then keep it with the tube for the subsequent installation, Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

(e) Install the protective covers on the fuel tube [16], hose [15] and fuel pump [1].

SUBTASK 73-11-11-020-007-F00

(9) Do these steps to disconnect the fuel supply hose [9] from the fuel pump inlet tube [12]:

(a) Remove the four bolts [11] to disconnect the fuel supply hose [9] and the gasket [10] from the fuel pump inlet tube [12].

(b) Move the fuel supply hose [9] away from the fuel pump inlet tube [12].

NOTE: If you have difficulty when you try to move the fuel supply hose, then remove the bolts and clamps that hold the fuel supply hose to the fan case.

1) If the gasket [10] is serviceable, then keep it with the tube for the subsequent installation, Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

2) Install the protective covers on the fuel supply hose [9] and the fuel pump inlet tube [12].

SUBTASK 73-11-11-020-008-F00

(10) Do these steps to remove the fuel pump [1]:

(a) Make sure that the protective covers are installed on all openings in the fuel pump [1].

(b) Remove the QAD bolt [22].

1) Install it in the opposite position with the jacking block, SPL-2189.

a) Keep the ball seat washer [23] for the subsequent installation.

WARNING: BE CAREFUL WHEN YOU REMOVE THE FUEL PUMP. THE FUEL PUMP WEIGHS APPROXIMATELY 46.3 POUNDS (21 KG). THE WEIGHT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(WARNING PRECEDES)

CAUTION DO NOT LIFT THE FUEL PUMP BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT SUPPORT THE WEIGHT OF THE FUEL PUMP. IF THE DRIVE SHAFT SUPPORTS THE WEIGHT OF THE FUEL PUMP, IT CAN CAUSE DAMAGE TO THE FUEL PUMP SEALS.

CAUTION YOU MUST HOLD THE WEIGHT OF THE FUEL PUMP AS YOU LOOSEN THE QAD RING. IF YOU DO NOT CORRECTLY HOLD THE WEIGHT (ALL OF THE TIME) AS YOU LOOSEN THE QAD RING, THE QAD RING WILL NOT OPEN.

(c) Do these steps to loosen the QAD ring (Figure 403).

1) Use a non-metallic hammer to hit the QAD ring [24] in the counterclockwise direction.

CAUTION DO NOT TIGHTEN THE QAD BOLT TO MORE THAN 300 POUND-INCHES (34 NEWTON METERS). IF YOU TIGHTEN THE QAD BOLT TOO MUCH, YOU CAN CAUSE DAMAGE TO THE QAD RING.

2) Tighten the QAD bolt [22] to 300 in-lb (34 N·m).

3) Continue to hit the QAD ring [24] and tighten the bolt [22] until the QAD ring moves to the open position.

(d) Carefully disengage the fuel pump [1] drive shaft from the Accessory Gearbox (AGB).

(e) Remove the fuel pump [1] from the engine.

1) Install the cover on the AGB mounting face.

(f) Remove and discard the packing support [25].

(g) Remove and discard the O-ring [26] from the fuel pump drive shaft.

SUBTASK 73-11-11-020-009-F00

(11) If necessary, do these steps to remove the fuel pump inlet tube [12] from the fuel pump [1].

(a) Remove the four bolts [14] that hold the fuel pump inlet tube [12] and the gasket [13] to the fuel pump [1].

(b) Remove the fuel pump inlet tube [12] and gasket [13].

1) If the gasket [13] is serviceable, then keep it with the tube for the subsequent installation, Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

2) Install protective covers on the fuel pump inlet tube [12] and fuel pump [1].

SUBTASK 73-11-11-020-010-F00

(12) If you replace the fuel pump, remove the fuel filter differential pressure switch from the fuel pump for installation on the replacement fuel pump:

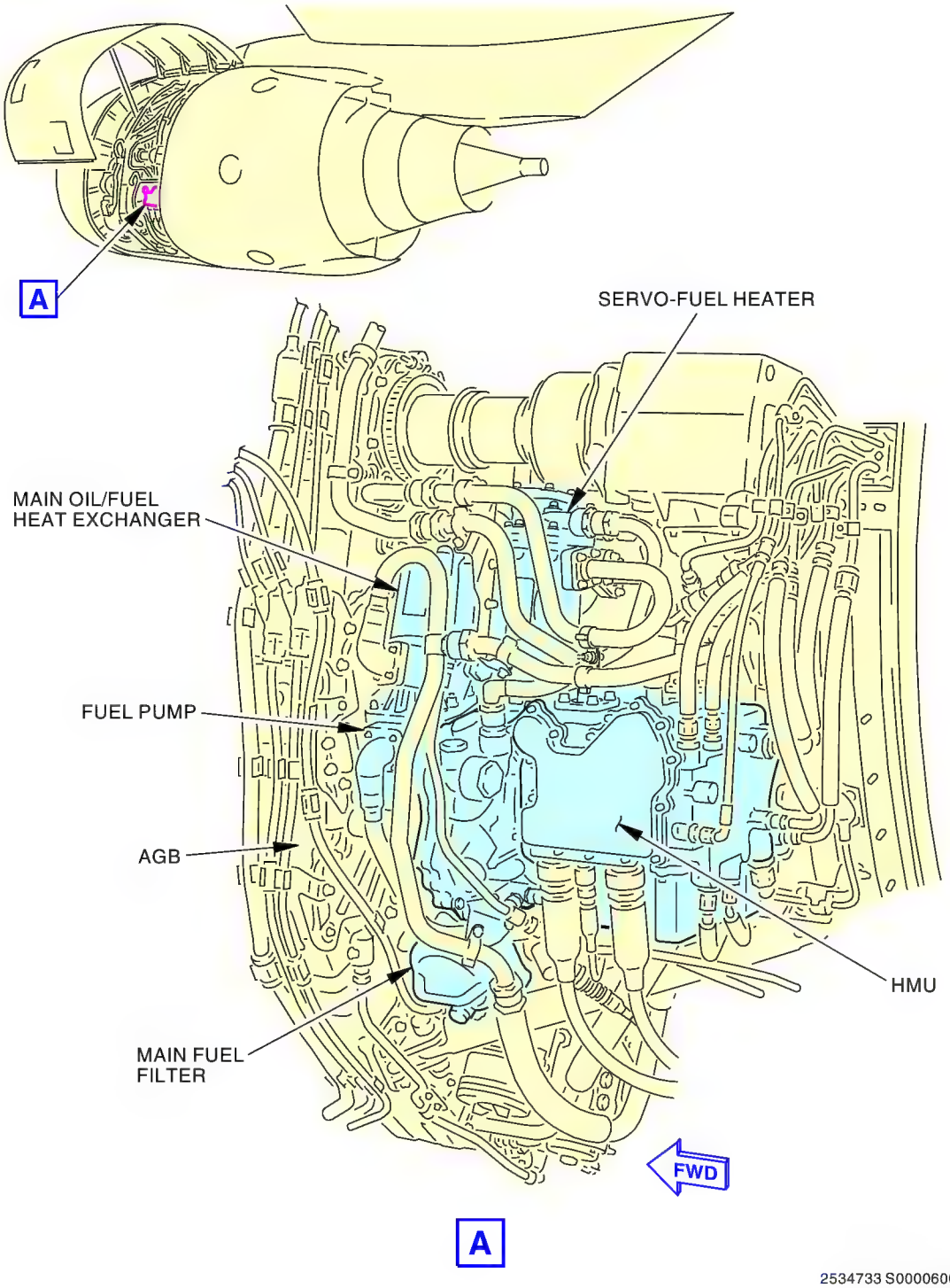
(a) Do this task: Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal, TASK 73-34-01-000-801-F00.

SUBTASK 73-11-11-620-001-F00

(13) If it is necessary to preserve the fuel pump, do this task: Fuel Pump Preservation, TASK 73-11-01-600-801-F00.

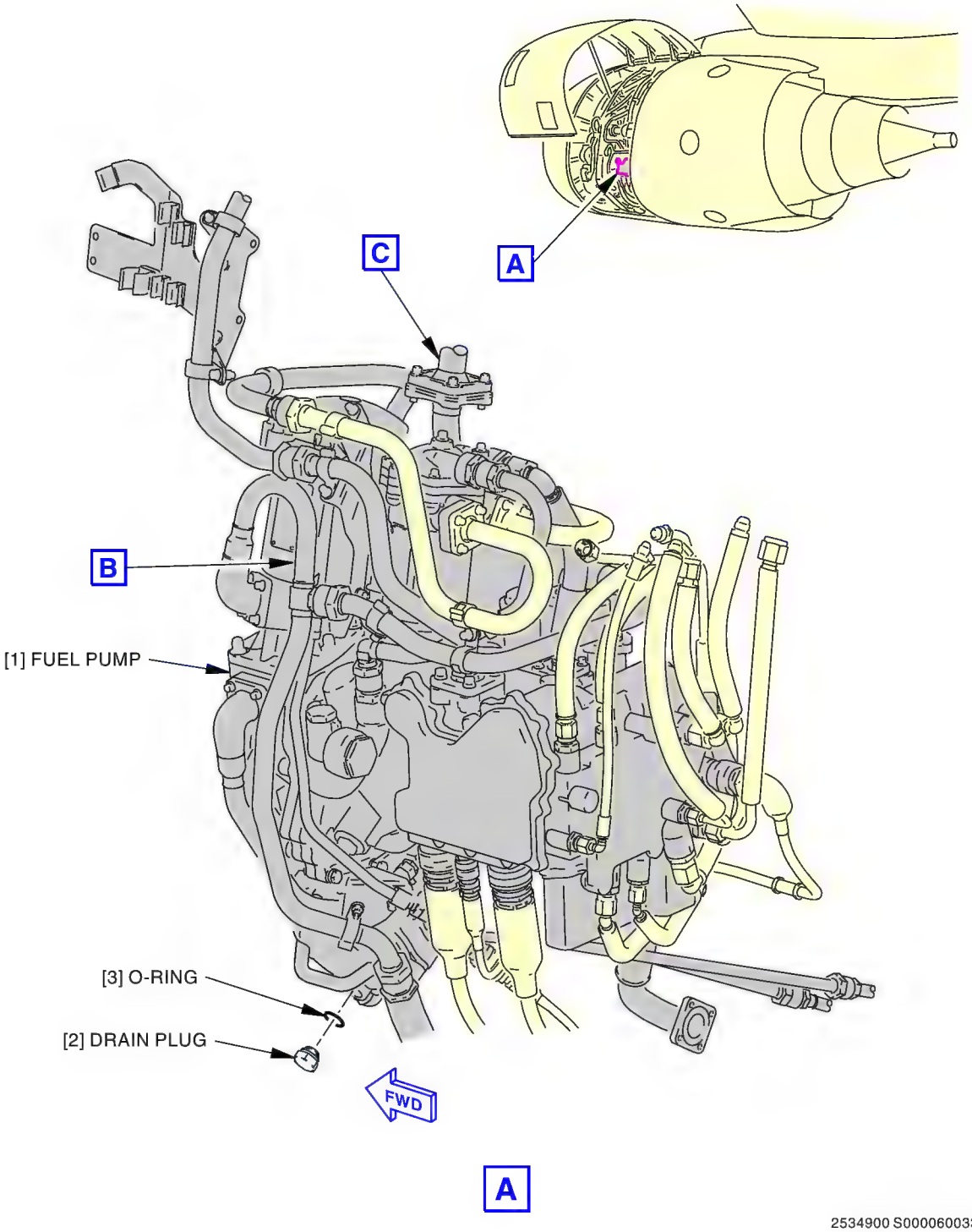
END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



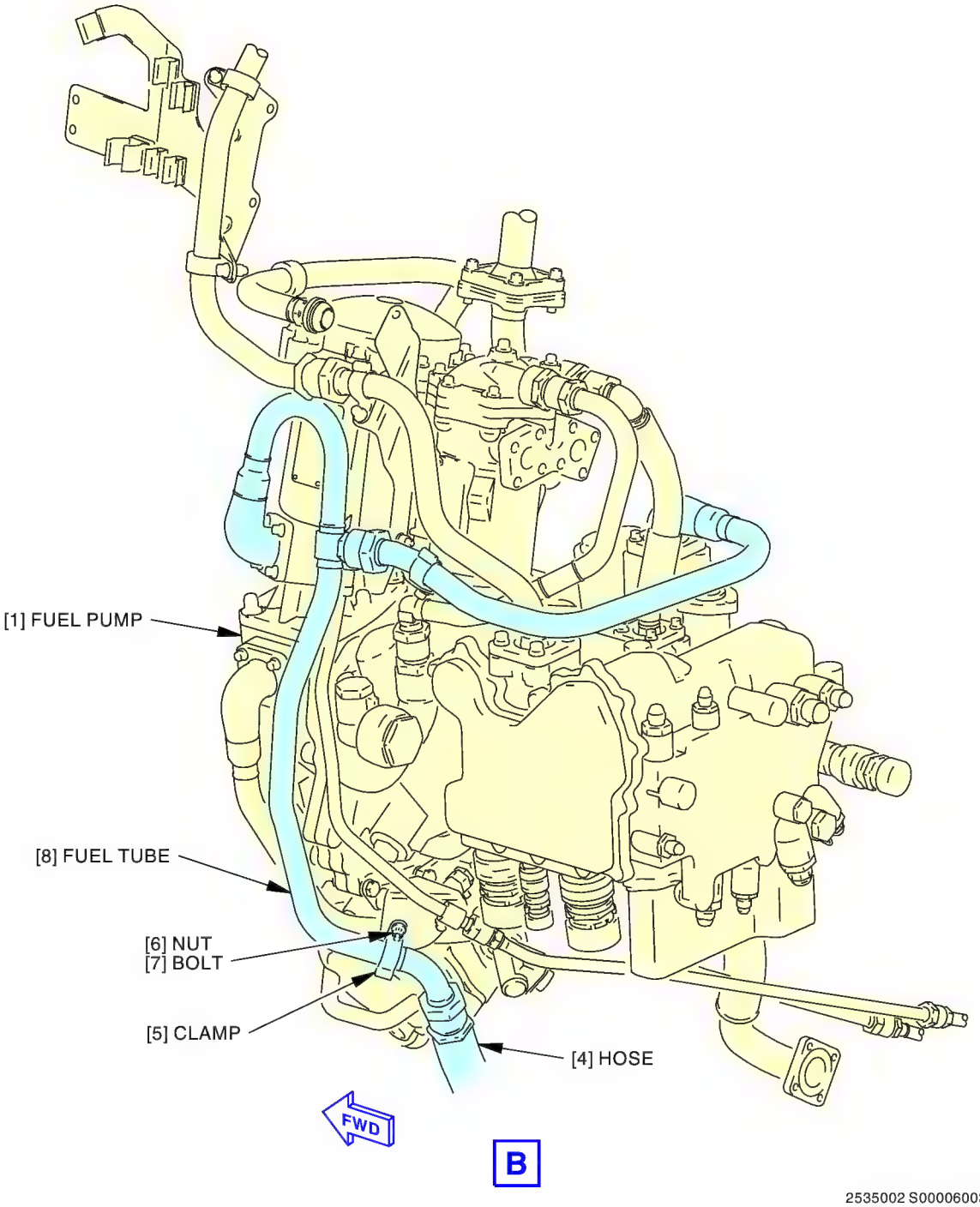
Fuel Pump Components
Figure 401/73-11-11-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



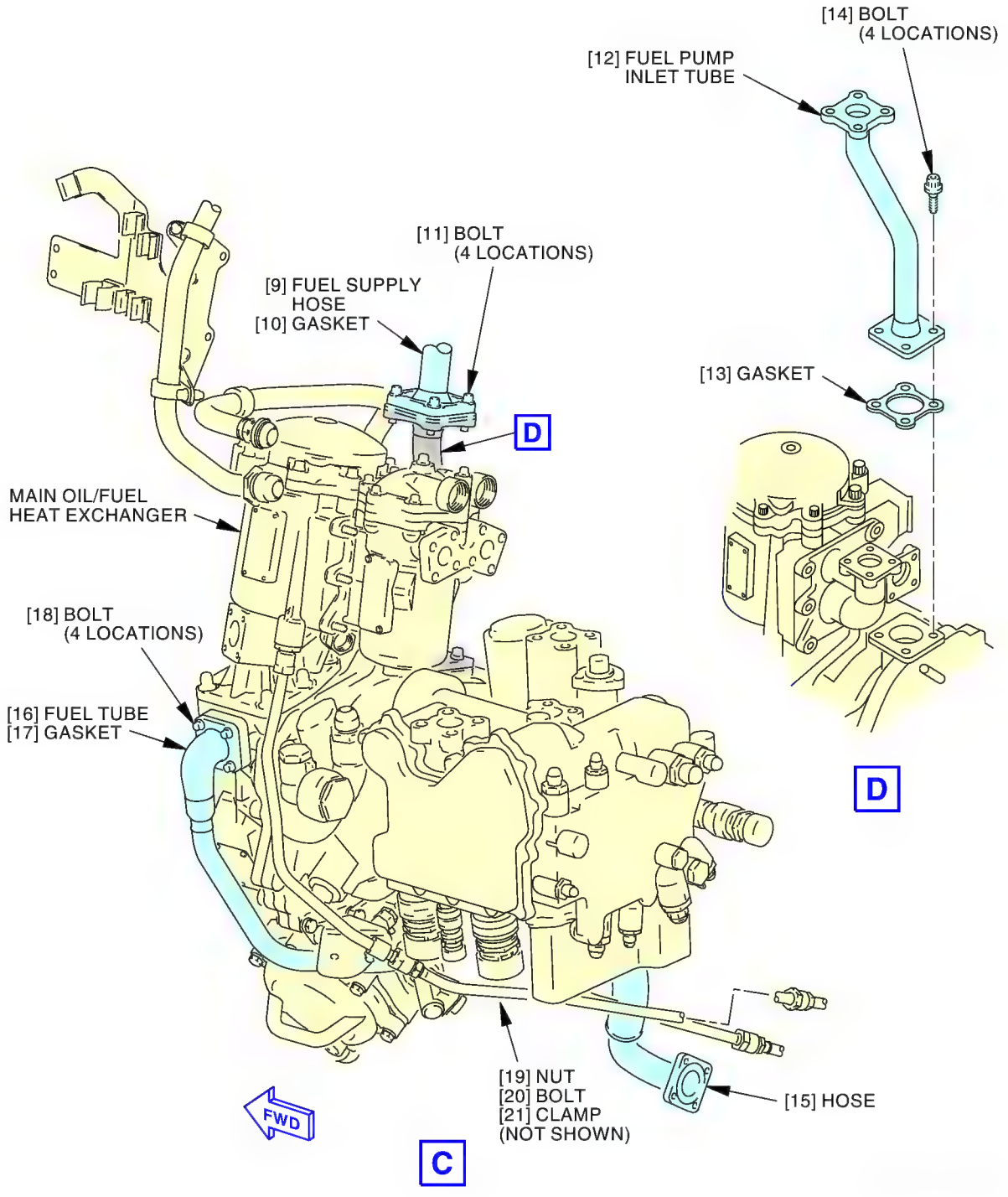
Fuel pump Installation/Removal
Figure 402/73-11-11-990-802-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



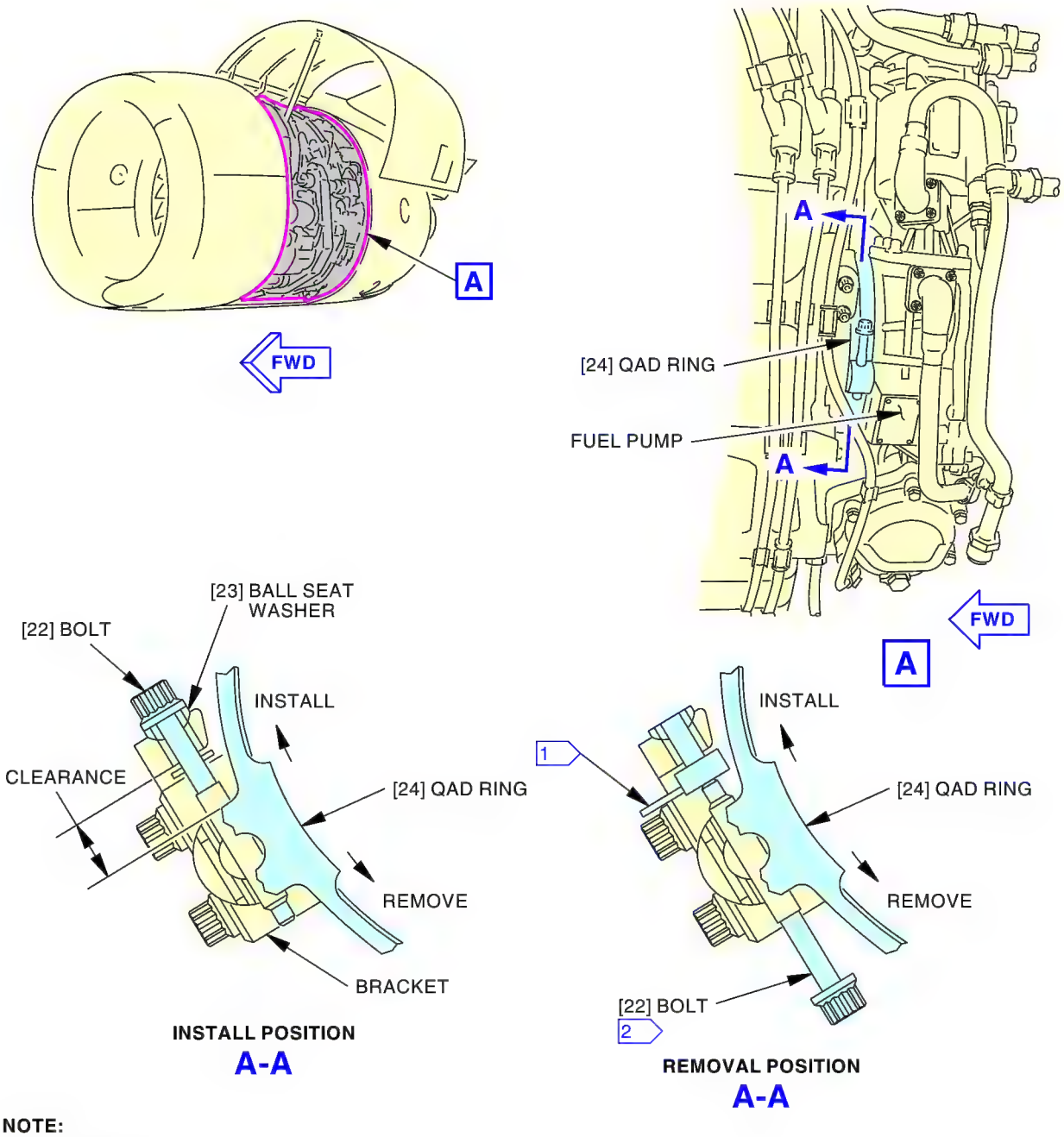
Fuel pump Installation/Removal
Figure 402/73-11-11-990-802-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel pump Installation/Removal
Figure 402/73-11-11-990-802-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



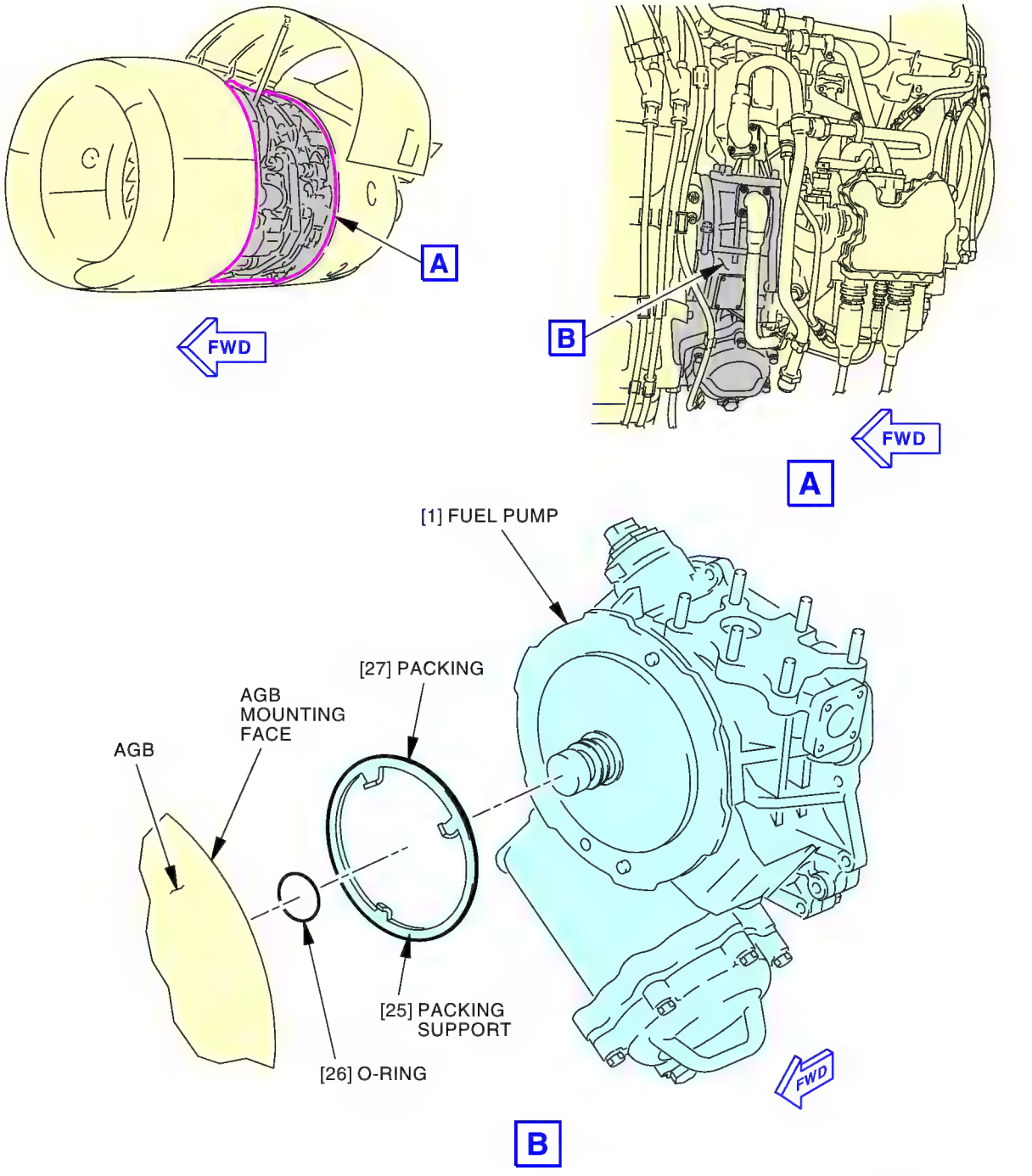
NOTE:

1. JACKING BLOCK USED AS THRUST PLATE FOR QAD RING REMOVAL
2. INSTALLED BACKWARD THROUGH CAPTIVE BARREL NUT FOR JACKING

2535187 S0000600335_V2

Fuel Pump QAD Ring Installation/Removal
Figure 403/73-11-11-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



2535361 S0000600336_V2

Fuel Pump Sealing Installation/Removal
Figure 404/73-11-11-990-804-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-11-11-400-801-F00

3. Fuel Pump Installation

(Figure 401, Figure 402, Figure 403 and Figure 404).

A. General

(1) This task gives the instruction on how to install the fuel pump.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
72-63-01-000-801-F00	Handcranking Drive Cover Removal (P/B 201)
72-63-01-400-801-F00	Handcranking Drive Cover Installation (P/B 201)
73-11-07-400-801-F00	Servo Fuel Heater Installation (P/B 401)
73-21-10-400-801-F00	HMU Installation (P/B 401)
73-34-01-400-801-F00	Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation (P/B 401)
79-21-02-400-801-F00	Main Oil/Fuel Heat Exchanger Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00599 [CP2442]	Oil - Engine	CFM CP2442
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999
10	Gasket	28-22-51-01A-020	IDC ALL
13	Gasket	73-11-00-02-270	IDC 001-006
		73-11-00-02A-325	IDC 007-010, 012-999
17	Gasket	73-11-00-02-260	IDC 001-006
		73-11-00-02A-310	IDC 007-010, 012-999
25	Packing support	73-11-01-01-038	IDC 001-006
		73-11-01-01A-080	IDC 007-010, 012-999

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
26	O-ring	73-11-01-01-036	IDC 001-006
		73-11-01-01A-075	IDC 007-010, 012-999
27	Packing	73-11-01-01-040	IDC 001-006
		73-11-01-01A-085	IDC 007-010, 012-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 73-11-11-840-001-F00

(1) Do these steps to prepare the installation of the parts removed from the defective fuel pump:

(a) Remove the protective covers from the disconnected parts.

(b) Do these steps to examine the parts:

1) Clean the mating surfaces of the parts and the adjacent areas.

2) Examine the mating surfaces of the parts and the adjacent areas.

(c) Install the protective covers on the disconnected parts.

(d) Examine the gaskets to make sure that they are serviceable, Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

(e) Make sure that the drain plug [2] is correctly installed.

1) If it not installed or is loose, install the drain plug [2].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

a) Lubricate the new O-ring [3] with the oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

b) Install the new O-ring [3] on the drain plug [2].

c) Lubricate the threads of the drain plug [2] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

d) Install the drain plug [2].

e) Tighten the drain plug [2] to 45.0 in-lb (5.08 N·m) - 55.0 in-lb (6.21 N·m).

f) Install the safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [2].

SUBTASK 73-11-11-420-001-F00

(2) If you install a replacement pump, install the fuel filter differential pressure switch that follows:

(a) Do this task: Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation, TASK 73-34-01-400-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

G. Fuel Pump Installation

SUBTASK 73-11-11-420-002-F00

> **CAUTION** MAKE SURE THAT YOU INSTALL THE FUEL PUMP INLET-TUBE IN THE CORRECT ORIENTATION. THE FUEL SUPPLY TUBE MUST DESCRIBE AN "S" SHAPE WHEN YOU SEE IT FROM THE LEFT OF THE ENGINE. INSTALLING THE TUBE IN A DIFFERENT POSITION MAY RESULT IN CHAFING OF THE TUBE WITH THE AGB LINK AND CAUSE DAMAGE TO THE FUEL PUMP INLET TUBE.

(1) Do these steps to install the fuel pump inlet tube [12] on the fuel pump [1].

(a) Lubricate these parts:

1) Lubricate the new gasket [13] with vaseline, D00672 [CP5070], or oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [14] with graphite mineral vaseline, D00601 [CP2101].

(b) Remove the protective covers from the bottom of the fuel pump inlet tube [12] and the applicable covers from the fuel pump [1].

(c) Use the four bolts [14] to connect the fuel pump inlet tube [12] and the new gasket [13] to the fuel pump [1].

1) Tighten the bolts [14] to 97 in-lb (11.0 N·m) - 110 in-lb (12.4 N·m).

SUBTASK 73-11-11-480-001-F00

(2) Do these steps to prepare for the installation of the fuel pump [1].

> **WARNING** DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Lubricate a new O-ring [26] with vaseline, D00672 [CP5070], or oil, D00623 [CP5066].

(b) Install the new O-ring [26] in the groove of the fuel pump drive shaft.

(c) Lubricate a new packing support [25] with vaseline, D00672 [CP5070], or oil, D00623 [CP5066].

(d) Install the new packing [27] on the new packing support [25].

(e) Install the new packing support [25] on the fixed part of the QAD ring [24].

> **WARNING** DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(f) Lubricate the threads of the QAD bolt [22] with engine oil, D00599 [CP2442].

SUBTASK 73-11-11-420-003-F00

(3) Do these steps to install the fuel pump [1]:

(a) If it is necessary, turn the Accessory Gearbox (AGB) output shaft to align with the fuel pump drive shaft (Handcranking Drive Cover Removal, TASK 72-63-01-000-801-F00).

1) Turn the handcranking drive pad with a 3/4-inch square drive to align the AGB drive recess with the fuel pump drive shaft splines.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING BE CAREFUL WHEN YOU INSTALL THE FUEL PUMP. THE FUEL PUMP WEIGHS APPROXIMATELY 46.3 POUNDS (21 KG). THE WEIGHT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION DO NOT LIFT THE FUEL PUMP BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT SUPPORT THE WEIGHT OF THE FUEL PUMP. IF THE DRIVE SHAFT SUPPORTS THE WEIGHT OF THE FUEL PUMP, IT CAN CAUSE DAMAGE TO THE FUEL PUMP SEALS.

(b) Engage the fuel pump [1] in the AGB.

(c) Turn the QAD ring [24] clockwise until it engages with the fuel pump flange.

(d) Make sure that the ball seat washer [23] is correctly installed on the QAD ring [24].

(e) Install the QAD bolt [22] in the QAD ring [24].

CAUTION DO NOT TIGHTEN THE QAD BOLT TO MORE THAN 320 POUND-INCHES (36 NEWTON METERS). IF YOU TIGHTEN THE QAD BOLT TOO MUCH, YOU CAN CAUSE DAMAGE TO THE QAD RING.

(f) Tighten the QAD bolt [22] to 310 in-lb (35 N·m) - 320 in-lb (36 N·m).

1) Lightly hit all around the outer surface of the QAD ring [24] with a non-metallic hammer or a rubber mallet.

2) Loosen the QAD bolt [22].

(g) Tighten the QAD bolt [22] to 310 in-lb (35 N·m) - 320 in-lb (36 N·m).

1) Lightly hit all around the outer surface of the QAD ring [24] with a non-metallic hammer or a rubber mallet.

2) Loosen the QAD bolt [22].

(h) Tighten the QAD bolt [22] to 310 in-lb (35 N·m) - 320 in-lb (36 N·m).

1) Lightly hit all around the outer surface of the QAD ring [24] with a non-metallic hammer or a rubber mallet.

2) Loosen the QAD bolt [22].

(i) Tighten the QAD bolt [22] to 195 in-lb (22 N·m) - 230 in-lb (26 N·m).

(j) Measure the clearance between the QAD ring [24] and the flange of the QAD ring [24] support.

1) If the clearance is more than 1.0 in. (25.4 mm) or less than 0.25 in. (6.4 mm), replace the QAD ring [24].

(k) Install the safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the QAD bolt [22].

(l) Do this task: Handcranking Drive Cover Installation, TASK 72-63-01-400-801-F00.

SUBTASK 73-11-11-420-004-F00

(4) Do these steps to connect the fuel supply hose [9] to the fuel pump inlet tube [12] on the fuel pump [1].

(a) Lubricate these parts:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [10] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].
2) Lubricate the threads of the bolts [11] with Never-Seez NSBT compound, D00006.

(b) Remove the protective covers from the fuel supply hose [9] and the top end of the fuel pump inlet tube [12].

(c) Put the fuel supply hose [9] and the gasket [10] in the correct position on the fuel pump inlet tube [12].

NOTE: If it is not easy to put the fuel supply hose into its position, remove the bolts and clamps that hold the fuel supply hose to the fan case.

(d) Use the four bolts [11] to connect the fuel supply hose [9] and the gasket [10] to the fuel pump inlet tube [12].

1) Tighten the bolts [11] to 50 in-lb (5.6 N·m) - 55 in-lb (6.2 N·m).

(e) If you removed or loosened the clamps, install the clamps and the bolts to connect the fuel supply hose [9] to the fan case.

1) Tighten the bolts for the clamps to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

NOTE: Make sure that there is a clearance of 0.625 in. (15.9 mm) between fuel supply hose [9] and adjacent electrical wiring.

SUBTASK 73-11-11-420-005-F00

CAUTION
USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(5) Do these steps to install the fuel tube [16] on the fuel pump [1] and on the hose [15].

(a) Remove the protective covers from the hose [15], fuel tube [16] and the applicable covers from the fuel pump [1].

(b) Lubricate these parts:

1) Lubricate the gasket [17] with vaseline, D00672 [CP5070], or oil, D00623 [CP5066].
2) Lubricate the threads of the bolts [18] and the bolt [20] with graphite mineral vaseline, D00601 [CP2101].

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

3) Lubricate the threads of the nipple of the fuel tube [16] with oil, D00623 [CP5066], or vaseline, D00672 [CP5070].

(c) Put the fuel tube [16] with the new gasket [17] in the correct position between the fuel pump [1] and the hose [15].

(d) Install the four bolts [18] that hold the fuel tube [16] and gasket [17] to the fuel pump [1].

(e) Connect the fuel tube [16] to the hose [15].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) Use the nut [19], bolt [20] and clamp [21] to connect the fuel tube [16] to the bottom of the fuel pump [1].

(g) Make sure that the fuel tube [16] does not touch other parts of the engine.

(h) Tighten the bolts [18] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

(i) Use two wrenches to tighten the coupling nut between fuel tube [16] and hose [15] to 900 in-lb (102 N·m) - 1100 in-lb (124 N·m).

(j) Tighten the nut [19] to 62 in-lb (7 N·m) - 71 in-lb (8 N·m).

SUBTASK 73-11-11-410-001-F00

(6) Do this task: Main Oil/Fuel Heat Exchanger Installation, TASK 79-21-02-400-801-F00.

NOTE: Do not tighten the nut [6] and the bolt [7] that hold the fuel tube [8] to the bracket before the connection of the fuel tube [8] to the hose [4].

SUBTASK 73-11-11-420-006-F00

(7) Connect the fuel tube [8] to the hose [4].



CAUTION

USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

(a) Remove the protective covers from fuel tube [8] and hose [4].



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(b) Lubricate the threads of the nipple of the hose [4] with oil, D00623 [CP5066],or vaseline, D00672 [CP5070].

(c) Use your hands to connect the fuel tube [8] to the hose [4].

(d) Use two wrenches to tighten the coupling nut, between fuel tube [8] and the hose [4] to a torque of 900 in-lb (102 N·m) to 1100 in-lb (124 N·m).

(e) Tighten the nut [6] that holds the clamp [5] to 62 in-lb (7 N·m) - 71 in-lb (8 N·m).

SUBTASK 73-11-11-410-002-F00

(8) Do this task: Servo Fuel Heater Installation, TASK 73-11-07-400-801-F00.

SUBTASK 73-11-11-410-003-F00

(9) Do this task: HMU Installation, TASK 73-21-10-400-801-F00

H. Put the Airplane Back to Its Usual Condition

SUBTASK 73-11-11-410-004-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00...

SUBTASK 73-11-11-840-002-F00

(2) Do these steps to put the airplane in a serviceable condition:

(a) Remove the DO-NOT-OPERATE tag from the start lever.

(b) Remove the DO-NOT-OPERATE tag from the BAT switch panel P5-13.

SUBTASK 73-11-11-860-002-F00

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

I. Fuel Pump Package Installation Test

SUBTASK 73-11-11-720-001-F00

CAUTION

DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(1) If necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

SUBTASK 73-11-11-720-002-F00

CAUTION

MAKE SURE THE BOOST PUMPS ARE TURNED ON WHEN YOU DO TEST 12 (ACTUATORS TEST) OF THE POWER PLANT TEST REFERENCE TABLE, OR DAMAGE TO THE FUEL PUMP CAN OCCUR.

(2) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL CONTROL SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains these tasks:

(1) EEC BITE TEST - RECENT FAULTS

(2) EEC BITE TEST - FAULT HISTORY

(3) Prepare for the Tests

(4) The FADEC System Test

(5) The EEC TEST

(6) The T/R LEVER INTLK (Interlock) TEST

(7) Thrust Lever Adjustment and Thrust Reverser Position Adjustment Tests

(8) Engine 1 and Engine 2 Thrust Lever Angle Resolver Alignment Test

(9) The IDENT/CONFIG

(10) The EEC Discretes Test

(11) Erase All EEC Faults

(12) The FADEC 2 or FADEC 3 Identification.

TASK 73-21-00-740-803-F00

2. EEC BITE TEST - RECENT FAULTS

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) Use the Flight Management Computer/Control Display Unit (FMCS CDU) to do the Engine EEC BITE TEST.

(2) The EEC BITE - Recent Faults procedure shows maintenance messages for the three most recent flight legs.

(a) The maintenance messages are stored in the EEC and show on the FMCS CDU.

(b) The FMCS CDU shows the maintenance messages for only one engine at a time.

(3) The FMCS CDU shows only one maintenance message on each screen.

(a) The FMCS CDU shows the page you are on and the total number of pages.

NOTE: If the FMCS CDU screen shows 2/4, you are on page 2 of 4 pages.

(4) There are five categories of maintenance messages. The time limited dispatch limits which are given below are for on-condition events.

NOTE: The CFM56-7B Engine Shop Manual (CFMI-TP.SM.10), ATA 05-17-01 is the certified authority for the Time Limited Dispatch.

(a) ENGINE CONTROL LIGHT Faults - You can not dispatch the airplane with this fault.

NOTE: These faults cause the ENGINE CONTROL Light to come ON.

(b) ALTERNATE MODE LIGHT Fault - Refer to the Minimum Equipment List (MEL) for the dispatch limits.

NOTE: These faults cause the ALTN Mode Light to come ON.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) SHORT TIME Fault - Calculate the remaining flight hours that you can operate with this fault as follows:

1) The remaining Flight Hours (R) = 150 flight hours - "Q", where "Q" is the scheduled maintenance interval your airline uses to check the EEC BITE TEST - RECENT FAULTS, SHORT TIME category.

NOTE: If your airline looks for EEC faults every 70 flight hour, then "Q" = 70. If your airline looks for EEC faults every 150 flight hours, then "Q" = 150.

(d) LONG TIME Fault - Calculate the remaining flight hours that you can operate with this fault as follows:

1) The remaining Flight Hours (T) = 500 flight hours - "S/2", where "S/2" is one half of the scheduled maintenance interval your airline uses to check the EEC BITE TEST - RECENT FAULTS, LONG TIME category.

NOTE: If your airline looks for EEC faults every 70 flight hour, then "S/2" = 35. If your airline looks for EEC faults every 150 flight hours, then "S/2" = 75.

(e) ECONOMIC Awareness Fault - There are no time limits for dispatch. Repair the problem at a convenient time.

(5) The recent faults function will show the maintenance message numbers for the most recent three flight legs and one ground operation.

(a) Flight Legs 1 through 3 are the three most recent flight legs.

(b) Flight Leg 0:

1) Can show maintenance messages that occur more than 30 seconds after landing from the last flight leg.

2) Can show the most recent ground run of the engine.

NOTE: If the engine is started and stopped more than once between flights, Flight Leg 0 will contain data from the last ground run of the engine.

(c) The X below the flight leg number indicates that the fault occurred on that flight leg.

1) For flight legs that did not have the fault, the space below the flight legs number is blank.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation
FIM 73-22 TASK 806	Engine Position Signal is out of Range - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 73-21-00-740-003-F00

(1) Do these steps to get the RECENT FAULTS data for Engine 1 or Engine 2:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Get access to the FMCS CDU in the flight compartment.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

(d) Push these line select keys (LSK) on the FMCS CDU:

1) INDEX
2) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

3) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

4) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

(e) Push the RECENT FAULTS LSK.

NOTE: This LSK causes the RECENT FAULTS screen to show. The HISTORY LSK, on the Recent Faults screen, will show the fault history for the maintenance message that shows on the screen. The NEXT PAGE key will continue to show the other faults in the RECENT FAULTS format. The INDEX LSK will send you to the ENGINE X BITE TEST MAIN MENU.

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.
2) Record this data from each screen:
   a) The Dispatch Level

      NOTE: The dispatch level will show at the top of the screen. The FMCS CDU will display the faults in the order of their dispatch level. The ENGINE CONTROL light faults will show first, then the ALTERNATE MODE LIGHT faults, then the SHORT TIME faults, then the LONG TIME faults, and last the ECONOMIC awareness faults. Refer to the CFM56-7B Engine Shop Manual 05-17-01, or the General Statement of this procedure for the Time Limited Dispatch capabilities for each category of message.

   b) Maintenance Message Number

      NOTE: A seven digit number with this format: AA - XDDDN. AA = ATA Chapter, X = EEC Channel (1=Channel A, 2=Channel B, 3=Channels A and B), DDD = a unique fault number, and N = Engine Position (1=Engine 1, 2=Engine 2). If the message is reported with an engine position equal to zero, then for the applicable engine, do the corrective action for Engine Position Signal is out of Range (73-X138N) (FIM 73-22 TASK 806).

3) Push the NEXT PAGE key to see the subsequent maintenance message.
   a) Continue to push the NEXT PAGE key until you record all of the faults.
4) If you want to go back to the previous message, push the PREV PAGE key.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

5) If the ENGINE CONTROL light was ON and none of the ENGINE CONTROL light messages show during the EEC BITE Test, then, do this task: EEC TEST, TASK 73-21-00-700-804-F00.

a) Look for one or more of these Maintenance Message:

b) 73-10201, 73-10202, 73-20201 73-20202, 73-30201, 73-30202, 73-10211, 73-10212, 73-20211 73-20212, 73-30211, 73-30212, 73-10221, 73-10222, 73-20221 73-20222, 73-30221 or 73-30222.

NOTE: These INTERNAL EEC messages can set the ENGINE CONTROL light, but the problem that causes the fault also causes problems with the EEC BITE Test. When this occurs, the EEC cannot write to the EEC fault memory.

c) Do the corrective action in the FIM for the messages that you find.

(f) If the fault data is not available from one of the two channels (A and B) of the EEC, the screen will show the EEC channel that has data.

1) Example:

FOR CH B (A) ONLY, CH A (B) EEC DATA NOT AVAILABLE, CAN NOT ACCESS CH A (B)

(g) If you are in RECENT FAULTS and there are no faults stored for the flight legs 0 through 3, the screen will show NO RECENT FAULTS STORED.

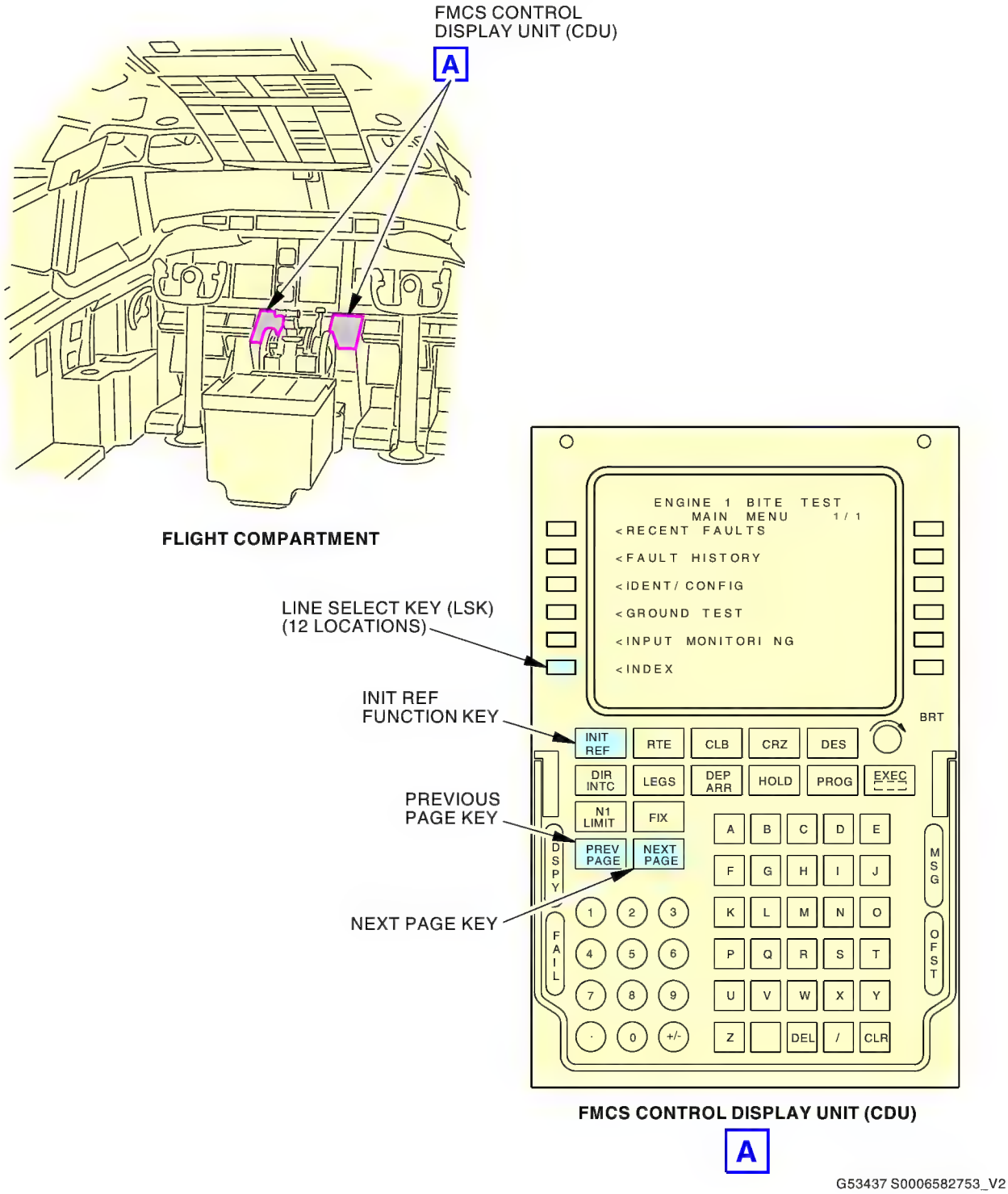
(h) If you wish to do other tests, push the INDEX LSK several times, until the correct menu shows.

(i) To end the test, push the INIT REF key.

NOTE: This causes the test to stop and automatically removes electrical power from the EEC.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Engine 1 BITE Test Main Menu
Figure 501/73-21-00-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-00-740-801-F00

3. EEC BITE TEST - FAULT HISTORY

(Figure 501)

A. General

(1) Use the Flight Management Computer/Control Display Unit (FMCS CDU) to do the EEC BITE TEST - FAULT HISTORY.

(2) The EEC BITE TEST - FAULT HISTORY procedure shows maintenance messages for the ten most recent flight legs.

(a) The maintenance messages are stored in the EEC and displayed on the FMCS CDU.

(b) The FMCS CDU shows the maintenance messages for only one engine at a time.

(3) The FMCS CDU shows only one maintenance message on each screen.

(a) The FMCS CDU shows the page you are on and the total number of pages.

NOTE: If the FMCS CDU screen shows 2/4, you are on page 2 of 4 pages.

(4) There are five categories of maintenance messages. The time limited dispatch limits which are given below are for on-condition events.

NOTE: The CFM56-7B Engine Shop Manual (CFMI-TP.SM.10), ATA 05-17-01 is the certified authority for the Time Limited Dispatch.

(a) ENGINE CONTROL LIGHT Faults - You can not dispatch the airplane with this fault.

NOTE: These faults cause the ENGINE CONTROL Light to come ON.

(b) ALTERNATE MODE LIGHT Fault - Refer to the Minimum Equipment List (MEL) for the dispatch limits.

NOTE: These faults cause the ALTN Mode Light to come ON.

(c) SHORT TIME Fault - Calculate the remaining flight hours that you can operate with this fault as follows:

1) The remaining Flight Hours (R) = 150 flight hours - "Q", where "Q" is the scheduled maintenance interval your airline uses to check the EEC BITE TEST - RECENT FAULTS, SHORT TIME category.

NOTE: If your airline looks for EEC faults every 70 flight hour, then "Q" = 70. If your airline looks for EEC faults every 150 flight hours, then "Q" = 150.

(d) LONG TIME Fault - Calculate the remaining flight hours that you can operate with this fault as follows:

1) The remaining Flight Hours (T) = 500 flight hours - "S/2", where "S/2" is one half of the scheduled maintenance interval your airline uses to check the EEC BITE TEST - RECENT FAULTS, LONG TIME category.

NOTE: If your airline looks for EEC faults every 70 flight hour, then "S/2" = 35. If your airline looks for EEC faults every 150 flight hours, then "S/2" = 75.

(e) ECONOMIC Awareness Fault - There are no time limits for dispatch. Repair the problem at a convenient time.

(5) The fault history function will show the maintenance message numbers for the ten most recent flight legs and one ground operation.

(a) Flight Leg 1 shows the data for the most recent flight leg.

(b) Flight Leg 10 shows the data for the oldest flight leg that is stored in the system.

(c) Flight Leg 0:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Can show maintenance messages that occur more than 30 seconds after landing from the last flight leg.

2) Can show the most recent ground run of the engine.

NOTE: If the engine is started and stopped more than once between flights, Flight Leg 0 will contain data from the last ground run of the engine.

(6) The X below the flight leg number indicates that the fault occurred on that flight leg.

(a) For flight legs that did not have the fault, the space below the flight legs number is blank.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation
FIM 73-22 TASK 806	Engine Position Signal is out of Range - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 73-21-00-740-001-F00

(1) Do these steps to get the FAULT HISTORY data for Engine 1 or Engine 2:

(a) Make sure that the airplane has electrical power.

1) If it is necessary, do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Get access to the FMCS CDU in the flight compartment.

(c) Push the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

(d) Push these line select keys (LSK) on the FMCS CDU:

1) INDEX

2) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

3) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

4) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

(e) Push the FAULT HISTORY LSK.

NOTE: This LSK causes the FAULT HISTORY screen to show. The INDEX LSK will send you to the ENGINE X BITE TEST MAIN MENU.

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Record this data from each maintenance message screen:
   a) The Dispatch Level
      NOTE: The dispatch level will show at the top of the screen. The FMCS CDU will display the faults in the order of their dispatch level. The ENGINE CONTROL light faults will show first, then the ALTERNATE MODE LIGHT faults, then the SHORT TIME faults, then the LONG TIME faults, and last the ECONOMIC awareness faults. Refer to the CFM56-7B Engine Shop Manual 05-17-01, or the General Statement of this procedure for the Time Limited Dispatch capabilities for each category of message.
   b) Maintenance Message Number
      NOTE: A seven digit number with this format: AA - XDDDN. AA = ATA Chapter, X = EEC Channel (1 =Channel A, 2 =Channel B, 3 =Channels A and B), DDD = a unique fault number, and N = Engine Position (1 =Engine 1, 2 =Engine 2). If the message is reported with an engine position equal to zero, then for the applicable engine, do the corrective action for Engine Position Signal is out of Range (73-X138N)(FIM 73-22 TASK 806).
3) Push the NEXT PAGE key to see the subsequent maintenance message.
   a) Continue to push the NEXT PAGE key until you record all of the applicable maintenance message data that is stored in the system.
4) If you want to go back to the previous message, push the PREV PAGE key.
5) If the ENGINE CONTROL light was ON and none of the ENGINE CONTROL light messages show during the EEC BITE Test, then, do this task: EEC TEST, TASK 73-21-00-700-804-F00.
   a) Look for one or more of these Maintenance Message:
   b) 73-10201, 73-10202, 73-20201 73-20202, 73-30201, 73-30202, 73-10211, 73-10212, 73-20211 73-20212, 73-30211, 73-30212, 73-10221, 73-10222, 73-20221 73-20222, 73-30221 or 73-30222.
      NOTE: These INTERNAL EEC messages can set the ENGINE CONTROL light, but the problem that causes the fault also causes problems with the EEC BITE Test. When this occurs, the EEC cannot write to the EEC fault memory.
   c) Do the corrective action in the FIM for the messages that you find.

(f) If the fault data is not available from the two channels (A and B) of the EEC, the screen will show the EEC channel that has data.
   1) Example:
      FOR CH B (A) ONLY, CH A (B) EEC DATA NOT AVAILABLE, CAN NOT ACCESS CH A (B)

(g) If you are in FAULT HISTORY and there are no faults stored for the flight legs 0 through 10, the screen will show NO FAULT HISTORY STORED.

(h) If you wish to do other tests, push the INDEX LSK several times, until the correct menu shows.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(i) To end the test, push the INIT REF key.

NOTE: This causes the test to stop and automatically removes electrical power from the EEC.

——— END OF TASK ———

TASK 73-21-00-840-801-F00

4. Prepare for the Tests

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Prepare for the Tests

SUBTASK 73-21-00-840-001-F00

(1) Do these steps to prepare for the test:

(a) Make sure that the airplane has electrical power.

1) If it is necessary, do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) For engine 1, do this step:

Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	5	C01009	ADIRU LEFT DC
E	7	C01007	ADIRU LEFT AC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A
A	6	C01017	FMCS CMPTR 1
D	2	C01372	DISPLAY CTR UPR
D	5	C01359	DISPLAY DEU 1 PRI
E	8	C00425	ADIRU LEFT EXC

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
C	14	C01008	ADIRU RIGHT AC
C	15	C00426	ADIRU RIGHT EXC
C	17	C01010	ADIRU RIGHT DC
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	10	C01361	DISPLAY DEU 1 HOLDUP

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	11	C01360	DISPLAY DEU 2 PRI

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1
F	13	C01179	INDICATOR MASTER DIM SECT 7

(c) For engine 2, do this step:

Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	5	C01009	ADIRU LEFT DC
E	7	C01007	ADIRU LEFT AC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1
D	2	C01372	DISPLAY CTR UPR
D	5	C01359	DISPLAY DEU 1 PRI
E	8	C00425	ADIRU LEFT EXC

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
C	14	C01008	ADIRU RIGHT AC
C	15	C00426	ADIRU RIGHT EXC
C	17	C01010	ADIRU RIGHT DC
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	10	C01361	DISPLAY DEU 1 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2
F	13	C01179	INDICATOR MASTER DIM SECT 7

(d) Make sure that the Engine START LEVERS are in the CUTOFF position.

(e) Make sure that the ENGINE START switches are in the off position.

(f) Make sure that the thrust levers are at the IDLE stop.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(g) Make sure that the thrust reversers are in the retracted (stowed) position.

(h) Get access to the FMCS CDU in the flight compartment.

(i) Push the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

——— END OF TASK ———

TASK 73-21-00-700-802-F00

5. FADEC System Test

(Figure 501)

A. General

(1) This task is the complete test of the FADEC (Full Authority Digital Engine Controller) system.

(2) The task is used when the EEC or the Engine is replaced.

B. References

Reference	Title
71-00-00-700-807-F00	Test 12 - Actuators Test (P/B 501)
73-21-60-470-801-F00	EEC Software Load (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. FADEC System Test

SUBTASK 73-21-00-700-002-F00

(1) When you do the FADEC system test, you must make sure the configuration of the engine and EEC is compatible with the opposite engine and EEC, the airplane and thrust reversers.

NOTE: Refer to Boeing SB 737-71-1588 for concurrent requirements necessary for installation of a Tech Insertion (TI) CFM56-7BXX/3 engine or CFM56-7BXX SAC engine incorporating CFM-SB 72-0583 on 737-600/700/800/900/BBJ airplanes from Line Positions 1 through 2229.

NOTE: Refer to Boeing SB 737-71-1551 for concurrent requirements necessary for installation of TI CFM56-7BXX/3 engine or CFM56-7BXX SAC engine incorporating CFM-SB 72-0583 on 737-700/800 airplanes from Line Positions 2230 through 2252.

NOTE: Refer to Boeing SB 737-71-1582 for concurrent requirements necessary for installation of non-TI engine (CFM56-7BXX) engine or CFM56-7BXX SAC engines incorporating CFM-SB 72-0583 on airplanes delivered with TI engines (CFM56-7BXX/3) on 737-600/700/800/900/BBJ airplanes from Line Positions 2253 and on and all 737-900ER airplanes.

NOTE: A Tech Insertion (TI) engine has a "/3" after the thrust rating on the engine data plate. An example of a Singular Annular Combustor (SAC) Engine with TI is CFM56-7B22/3. An example of a non-TI engine is CFM56-7B22. The "XX" in CFM56-7BXX/3 is the thrust rating of the engine.

(a) Make sure the EEC software version on each engine is compatible with the other engine, thrust reverser and airplane. Refer to the task EEC Software Load, TASK 73-21-60-470-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Intermix of some EEC software versions is not permitted.
2) Some EEC software versions must be installed on both engines at the same time.
3) Some EEC software versions require concurrent changes to the airplane configuration.

SUBTASK 73-21-00-740-004-F00

(2) For an EEC replacement, do this task: Erase All EEC Faults, TASK 73-21-00-800-801-F00

SUBTASK 73-21-00-730-001-F00

(3) Do these steps to do the FADEC System Test:
(a) Do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.
(b) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.
(c) Do this task: IDENT/CONFIG, TASK 73-21-00-700-808-F00.
(d) Do this task: Test 12 - Actuators Test, TASK 71-00-00-700-807-F00.
(e) Do this task: EEC Discretes Test, TASK 73-21-00-700-809-F00.

——— END OF TASK ———

TASK 73-21-00-700-804-F00

6. EEC TEST

(Figure 501)

A. General

(1) The EEC Test causes each channel of the EEC to do an internal EEC test.
(2) To make sure that the technician can see the correct operation of the EEC, the test causes these fight deck effects:
(a) ENGINE CONTROL light
NOTE: This light is found on the Engine Module in the P5 Aft Overhead Panel.
(b) ALTN light
NOTE: This light is found on the EEC MODE Switch in the P5 Aft Overhead Panel.
(c) Fuel FILTER BYPASS light
NOTE: This light is found on the Fuel Control Module in the P5 Fwd Overhead Panel.
(d) OIL FILTER BYPASS message
NOTE: This message is found on the Engine Display.
(3) If faults are found during the test, the FMCS CDU will show the faults at the end of the test.

B. References

Reference	Title
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 73-21-00-730-002-F00

(1) Do these steps to do the EEC Test:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.

(b) If the FMCS CDU is not active from other EEC tests, do these steps:

1) Get access to the FMCS CDU in the flight compartment.

2) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

3) Push these line select keys (LSK) on the FMCS CDU:

a) INDEX

b) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

4) Push these line select keys (LSK) on the FMCS CDU:

a) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

b) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

c) GROUND TESTS

NOTE: This LSK causes the ENGINE X BITE TEST GROUND TEST menu to show.

d) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

e) EEC TEST

f) START TEST.

NOTE: You can stop the test at this time if you push the ABORT LSK. The screen will show the test is not completed because ABORT was selected.

(c) If the FMCS CDU is active from other EEC tests, do this step:

1) Push the INDEX LSK to get access to the ENGINE X BITE TEST GROUND TEST MENU.

(d) Make sure that these indications are off:

1) The ENG CONTROL light

NOTE: This light is found on the Engine Module in the P5 Aft Overhead Panel.

2) The ALTN light

NOTE: This light is found on the EEC MODE Switch in the P5 Aft Overhead Panel.

3) The fuel FILTER BYPASS light

NOTE: This light is found on the Fuel Control Module in the P5 Fwd Overhead Panel.

4) OIL FILTER BYPASS message.

NOTE: This message is found on the Engine Display.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Push the CONTINUE LSK and the test screen tells you CH A Test Is In Progress.

NOTE: The test should take less than one minute.

(f) Make sure that these indications are on for EEC channel A:

1) The ENG CONTROL light
2) The ALTN light
3) The fuel FILTER BYPASS light
4) The OIL FILTER BYPASS message.

(g) Push the CONTINUE LSK.

(h) Make sure that these indications are off:

1) The ENG CONTROL light
2) The ALTN light
3) The fuel FILTER BYPASS light
4) The OIL FILTER BYPASS message.

(i) Push the CONTINUE LSK and the test screen tells you CH B Test Is In Progress.

NOTE: The test should take less than one minute.

(j) Make sure that these indications are on for EEC channel B:

1) The ENG CONTROL light
2) The ALTN light
3) The fuel FILTER BYPASS light
4) The OIL FILTER BYPASS message.

(k) Push the CONTINUE LSK.

(l) Make sure that these indications are off:

1) The ENG CONTROL light
2) The ALTN light
3) The fuel FILTER BYPASS light
4) The OIL FILTER BYPASS message.

(m) If all of the indications above do not agree with the expected value (light was on when expected off or light was off when expected on), the test is not valid.

1) You must correct the problem with the applicable indication and do the test again.

NOTE: Refer to the Observed Fault Index for the applicable ATA (Chapter 73 or Chapter 79).

(n) Push the TEST RESULTS LSK.

(o) If faults are found, the test screen will show EEC TEST FAILED and you will find the maintenance message number (MSG NBR) and a short description of the fault.

NOTE: If there is more than one fault, the page you are on and the total number of pages will show on the screen. Example: 2/5 shows you are on page 2 of 5 pages.

1) Push the NEXT PAGE LSK until you have recorded all of the maintenance messages that show.
2) Do the corrective action in the FIM for the messages that show.

(p) If there are no faults, then the test screen will show EEC TEST PASSED.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(q) Push the END TEST LSK

NOTE: This causes TEST COMPLETED screen to show on the FMCS CDU.

(r) If you wish to do other tests, push the INDEX LSK several times, until the correct menu shows.

——— END OF TASK ———

TASK 73-21-00-700-805-F00

7. T/R LEVER INTLK (Interlock) TEST

(Figure 501)

A. General

(1) The T/R Lever Interlock test makes sure that each channel of the EEC can enable and disable the thrust reverser interlock.

(2) If a problem is found during the test, the FMCS CDU will show the applicable faults at the end of the test.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2418	Lockpin - Equipment, Thrust Reverser Actuation Module Lockout Part #: C78004-1 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Procedure

SUBTASK 73-21-00-730-003-F00

(1) Do these steps to do the T/R INTLK TEST:

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00

(b) Do these steps to install the lockpin, SPL-2418 in applicable the thrust reverser manual shutoff valve (TASK 78-31-00-040-802-F00):

1) Turn the manual shutoff valve handle clockwise to align the lockpin holes in the manual shutoff valve handle and the control valve module.

2) Install the lockpin.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) Make sure the lockpin is pushed fully in and engages the control valve module.

(c) For the applicable engine, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

(d) If the FMCS CDU is not active from other EEC tests, do these steps:

1) Get access to the FMCS CDU in the flight compartment.

2) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

3) Push these line select keys (LSK) on the FMCS CDU:

a) INDEX

b) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

c) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

d) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

e) GROUND TEST

NOTE: This LSK causes the ENGINE X BITE TEST GROUND TEST menu to show.

f) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

(e) If the FMCS CDU is active from other EEC tests, do this step:

1) Push the INDEX LSK to get access to the ENGINE X BITE TEST GROUND TEST MENU.

(f) Push the T/R INTLK TEST LSK.

NOTE: This will cause screen 1 of the T/R INTLK TEST to show. The screen contains a WARNING about the operation of the thrust reversers during this test.

(g) Push the START TEST LSK.

NOTE: The test can be stopped if you push the ABORT LSK. The screen will show the test is not completed because ABORT was selected.

(h) Do the thrust reverser lever interlock test:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Type "OK" on the FMCS CDU pad when you are ready to start the test.
2) Push the CONTINUE LSK.

   NOTE: This starts the check for Channel A.
3) Follow the instructions on the FMCS CDU test screen:
   a) Move the applicable reverse thrust lever rearward to the reverse idle mechanical stop.
   b) Stop (wait) for a minimum of five seconds.

      NOTE: The first channel of the EEC will make sure that the TRA signal from the thrust lever angle resolver does not command a thrust value that is higher than reverse idle thrust. The test may not show the maintenance messages correctly if you stop for less than five seconds.
   c) Push the CONTINUE LSK.
   d) Move the reverse thrust lever rearward to the full reverse thrust position. If you cannot move the reverse thrust lever, make sure you stop for at least 5 seconds in the subsequent step to set the maintenance messages.
   e) Stop (wait) for a minimum of five seconds.

      NOTE: The first channel of the EEC will make sure that the TRA signal from the thrust lever angle resolver commands a thrust value that is maximum reverse thrust. The test may not show the maintenance messages correctly if you stop for less than five seconds.
   f) Push the CONTINUE LSK.
   g) Move the reverse thrust lever forward to the retracted (stow) position.
   h) Push the CONTINUE LSK.

      NOTE: This starts the check for Channel B.
   i) Move the reverse thrust lever rearward to the reverse idle mechanical stop.
   j) Stop (wait) for a minimum of five seconds.

      NOTE: The second channel of the EEC will make sure that the TRA signal from the thrust lever angle resolver does not command a thrust value that is higher than reverse idle thrust. The test may not show the maintenance messages correctly if you stop for less than five seconds.
   k) Push the CONTINUE LSK.
   l) Move the reverse thrust lever rearward to the full reverse thrust position. If you cannot move the reverse thrust lever, make sure that you stop for at least 5 seconds in the subsequent step to set the maintenance messages.
   m) Stop (wait) for a minimum of five seconds.

      NOTE: The second channel of the EEC will make sure that the TRA signal from the thrust lever angle resolver commands a thrust value that is maximum reverse thrust. The test may not show the maintenance messages correctly if you stop for less than five seconds.
   n) Push the CONTINUE LSK.
   o) Move the reverse thrust lever forward to the retracted (stow) position.
4) Push the TEST RESULTS LSK.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) Look for the T/R LEVER INTLK TEST PASSED screen.

(i) If faults are found, the test screen will show T/R LEVER INTLK TEST FAILED and you will find the maintenance message number (MSG NBR) and a short description of the fault.

NOTE: If there is more than one fault, the page you are on and the total number of pages will show on the screen. Example: 2/5 shows that you are on page 2 of 5 pages.

1) Push the NEXT PAGE LSK until you have recorded all of the maintenance messages that show.

2) Do the corrective action in the FIM for the messages that show.

(j) Push the END TEST LSK.

NOTE: This causes TEST COMPLETED to show on the FMCS CDU.

(k) Make sure that the CH A INOP or CH B INOP messages do not show.

NOTE: The CH X INOP is found between the RETURN AIRPLANE TO NORMAL CONDITION and the INDEX prompt on the TEST COMPLETE screen.

1) If the CH A INOP or CH B INOP message shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

(l) Remove the lockpin, SPL-2418 from the thrust reverser manual shutoff valve (TASK 78-31-00-040-802-F00):

1) Remove the lock pin from the valve.

2) Turn the manual shutoff valve handle counterclockwise to the vertical position.

3) Put the lock pin in its cotton bag and put it in its usual storage position on the airplane.

4) Do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

(m) If you wish to do other tests, push the INDEX LSK several times, until the correct menu shows.

(n) To end the test, push the INIT REF key.

NOTE: This causes the test to stop and automatically removes electrical power from the EEC.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-00-700-806-F00

8. Thrust Lever Adjustment and Thrust Reverser Position Adjustment Test

A. General

(1) The Thrust Lever Adjustment and Thrust Reverser Position Adjustment Test makes sure that the two thrust lever position data and the thrust reverser position data agree with the expected indications.

(2) In the test, the technician monitors the TRA and thrust reverser data inputs.

B. References

Reference	Title
76-11-05-820-801-F00	Thrust Lever Angle Resolver Adjustment (P/B 501)
78-36-02-820-801-F00	Linear Variable Differential Transformer (LVDT) - Adjustment (P/B 501)
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR

SUBTASK 73-21-00-840-006-F00

WARNING

FOR AIRPLANES WITH PREDICTIVE WINDSHEAR, MAKE SURE THAT YOU OPEN THE CIRCUIT BREAKERS FOR THE WEATHER RADAR SYSTEM. THE FORWARD MOVEMENT OF THE THRUST LEVER CAN CAUSE THE AUTOMATIC OPERATION OF THE SYSTEM. THE OPERATION OF THIS SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT IN THE AREA OF THE NOSE RADOME

(1) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
IDC 025-999			
C	7	C01678	WEATHER RADAR RT RIGHT

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR			
D	13	C00120	WEATHER RADAR RT

IDC ALL

SUBTASK 73-21-00-730-004-F00

(2) Do these steps to do the Thrust Lever Adjustment and Thrust Reverser Position Adjustment Test:

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.

(b) If the FMCS CDU is not active from other EEC tests, do these steps:

1) Get access to the FMCS CDU in the flight compartment.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

3) Push these line select keys (LSK) on the FMCS CDU:

a) INDEX

b) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

c) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

d) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

(c) If the FMCS CDU is active from other EEC tests, push these LSKs:

1) INDEX

NOTE: This causes the ENGINE X BITE TEST GROUND TEST screen to show.

2) INDEX

NOTE: This causes the ENGINE X BITE TEST MAIN MENU screen to show.

(d) Push the INPUT MONITORING LSK.

(e) Push the CONTINUE LSK.

NOTE: This LSK causes the ENGINE X INPUT MONITORING menu to show.

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

(f) Push the CONTROL LOOPS LSK.

NOTE: This causes screen 1 of the CONTROL LOOPS to show.

(g) Push the NEXT PAGE key.

(h) Push the NEXT PAGE key.

NOTE: This causes screen 3 of the CONTROL LOOPS to show.

(i) Push the REV LSK.

NOTE: This causes the L REVERSER SLEEVE POSITION screen to show.

(j) Make sure that the POSITION CH A indication, for the left thrust reverser sleeve, is 0.0 ±4%.

(k) Make sure that the POSITION CH B indication, for the left thrust reverser sleeve, is 0.0 ±4%.

1) If the indication for the thrust reverser position is not in the limits, do this task: Linear Variable Differential Transformer (LVDT) - Adjustment, TASK 78-36-02-820-801-F00.

(l) Push the NEXT PAGE key.

NOTE: This causes the R REVERSER SLEEVE POSITION screen to show.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(m) Make sure that the POSITION CH A indication, for the right thrust reverser sleeve, is 0.0 ±4%.

(n) Make sure that the POSITION CH B indication, for the right thrust reverser sleeve, is 0.0 ±4%.

1) If the indication for the thrust reverser position is not in the limits, do this task: Linear Variable Differential Transformer (LVDT) - Adjustment, TASK 78-36-02-820-801-F00.

(o) Push these LSKs:

1) INDEX

NOTE: This causes screen 3 of the CONTROL LOOPS to show.

2) TRA

NOTE: This causes the Thrust Lever Resolver Angle (TRA) for the two channels to show.

(p) Make sure that the thrust levers are in the IDLE position.

(q) Make sure that the POSITION CH A indication is 36.0 ±0.8 degrees.

(r) Make sure that the POSITION CH B indication is 36.0 ±0.8 degrees.

(s) Make sure that the difference between POSITION CH A and POSITION CH B is ±0.8 degrees.

1) If the indication for the TRA position is not in the limits, do this task: Thrust Lever Angle Resolver Adjustment, TASK 76-11-05-820-801-F00.

(t) Move the thrust levers to the full forward thrust position.

1) Stop for a minimum of 2 seconds.

(u) Make sure that the POSITION CH A indication is 84.0 ±1.8 degrees.

(v) Make sure that the POSITION CH B indication is 84.0 ±1.8 degrees.

(w) Make sure that the difference between POSITION CH A and POSITION CH B is ±1.0 degrees.

1) If the indication for the TRA position is not in the limits, do this task: Thrust Lever Angle Resolver Adjustment, TASK 76-11-05-820-801-F00.

(x) Move the thrust levers to the IDLE position.

(y) If you wish to do other tests, push the INDEX LSK several times, until the correct menu shows.

(z) To end the test, push the INIT REF key.

NOTE: This causes the test to stop and automatically removes electrical power from the EEC.

SUBTASK 73-21-00-840-007-F00

IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR

(3) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
IDC 025-999			
C	7	C01678	WEATHER RADAR RT RIGHT

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC 025-999 (Continued)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR			
D	13	C00120	WEATHER RADAR RT

IDC ALL

——— END OF TASK ———

TASK 73-21-00-700-807-F00

9. Engine 1 and Engine 2 Thrust Lever Angle Resolver Alignment Test

A. General

(1) The Engine 1 and Engine 2 Thrust Lever Resolver Alignment test makes sure that the two thrust level angle resolvers show the same data when they are in the same position.

(2) The test examines channel A for the two thrust levers. To make sure that channels A and B are equal, you can do the thrust lever adjustment in the Thrust Lever Adjustment and Thrust Reverser Position Adjustment Test.

B. References

Reference	Title
76-11-05-820-801-F00	Thrust Lever Angle Resolver Adjustment (P/B 501)
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR

SUBTASK 73-21-00-840-008-F00

WARNING FOR AIRPLANES WITH PREDICTIVE WINDSHEAR, MAKE SURE THAT YOU OPEN THE CIRCUIT BREAKERS FOR THE WEATHER RADAR SYSTEM. THE FORWARD MOVEMENT OF THE THRUST LEVER CAN CAUSE THE AUTOMATIC OPERATION OF THE SYSTEM. THE OPERATION OF THIS SYSTEM CAN CAUSE SERIOUS INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT IN THE AREA OF THE NOSE RADOME

(1) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
IDC 025-999			
C	7	C01678	WEATHER RADAR RT RIGHT

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC 025-999 (Continued)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR			
D	13	C00120	WEATHER RADAR RT

IDC ALL

SUBTASK 73-21-00-710-001-F00

(2) Do these steps to set the Engine 1 thrust lever:

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.

(b) If the FMCS CDU is not active from other EEC tests, do these steps:

1) Get access to the FMCS CDU in the flight compartment.

2) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

3) Push these line select keys (LSK) on the FMCS CDU:

a) INDEX

b) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

c) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

d) ENGINE 1

NOTE: This LSK causes the ENGINE 1 BITE TEST MAIN MENU to show. Also, the ENGINE 1 LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC 1 and EEC 1 SORTING FAULT HISTORY DATA, for a short time, just before the ENGINE 1 BITE TEST MAIN MENU shows.

e) GROUND TESTS

NOTE: This causes the ENGINE 1 BITE TEST GROUND TEST menu to show.

(c) If the FMCS CDU is active from other EEC tests, do these steps:

1) Push the INDEX LSK several times, until the MAINT BITE INDEX shows.

2) Push the ENGINE LSK.

NOTE: This causes the ENGINE/EXCEED BITE INDEX screen to show.

3) Push the ENGINE 1 LSK.

NOTE: This causes the ENGINE 1 BITE TEST MAIN MENU to show. Also, the ENGINE 1 LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC 1 and EEC 1 SORTING FAULT HISTORY DATA, for a short time, just before the ENGINE 1 BITE TEST MAIN MENU shows.

(d) Push the INPUT MONITORING LSK.

NOTE: This will cause the INPUT MONITORING menu to show.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

(e) Push the CONTROL LOOPS LSK.

NOTE: This will cause screen 1 of the CONTROL LOOPS to show.

(f) Push the NEXT PAGE key two times, to get access to screen 3 of the CONTROL LOOPS.

(g) Push the TRA LSK on screen 3 of the CONTROL LOOPS.

NOTE: This causes the Thrust Lever Resolver Angle (TRA) for channels A and B, of Engine 1, to show.

CAUTION

DO NOT LET THE SEL POSITION DISPLAY SHOW GREATER THAN 80.0 DEGREES, AS YOU DO THIS STEP. IF THE DISPLAY SHOWS MORE THAN 80.0 DEGREES, YOU MUST MOVE THE THRUST LEVER TO THE IDLE STOP AND START AGAIN. IF YOU DO NOT OBEY THESE INSTRUCTIONS, THE RESULTS OF THE TEST ARE NOT ACCURATE.

(h) Slowly move the Engine 1 thrust lever forward until the SEL POSITION display shows 78.0 ±2.0 degrees.

1) Make sure that the Engine 1 thrust lever does not move from this position for the remainder of the test.

(i) Record the value that shows in the POSITION CH A line to the nearest tenth of a degree.

SUBTASK 73-21-00-720-001-F00

(3) Do these steps to set the Engine 2 thrust lever:

(a) Push the INDEX LSK four times, to get access to the MAINT BITE INDEX screen.

(b) Push the ENGINE LSK.

NOTE: This causes the ENGINE/EXCEED BITE INDEX screen to show.

(c) Push the ENGINE 2 LSK.

NOTE: This causes the ENGINE 2 BITE TEST MAIN MENU to show. Also, the ENGINE 2 LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC 2 and EEC 2 SORTING FAULT HISTORY DATA, for a short time, just before the ENGINE 2 BITE TEST MAIN MENU shows.

(d) Push the INPUT MONITORING LSK.

NOTE: This will cause the INPUT MONITORING menu to show.

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

(e) Push the CONTROL LOOPS LSK.

NOTE: This will cause screen 1 of the CONTROL LOOPS to show.

(f) Push the NEXT PAGE key two times, to get access to screen 3 of the CONTROL LOOPS.

(g) Push the TRA LSK on screen 3 of the CONTROL LOOPS.

NOTE: This causes the Thrust Lever Resolver Angle (TRA) for channels A and B, of Engine 2, to show.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CAUTION

MAKE SURE THAT YOU DO NOT MOVE THE ENGINE 1 THRUST LEVER AS YOU DO THIS STEP. DO NOT LET THE ENGINE 2 THRUST LEVER GO TO A THRUST POSITION THAT IS GREATER THAN THE ENGINE 1 THRUST LEVER. IF THE ENGINE 2 THRUST LEVER GOES TO A THRUST POSITION THAT IS GREATER THAN THE ENGINE 1, YOU MUST MOVE THE ENGINE 2 THRUST LEVER TO THE IDLE STOP AND START AGAIN. IF YOU DO NOT OBEY THESE INSTRUCTIONS, THE RESULTS OF THE TEST ARE NOT ACCURATE.

(h) Slowly move the Engine 2 thrust lever forward until the knob aligns with the knob on the Engine 1 thrust lever, ±1/16 of a knob width.

(i) Record the value that shows in the POSITION CH A line to the nearest tenth of a degree.

(j) Calculate the difference between Engine 1 POSITION CH A and Engine 2 POSITION CH A.

NOTE: Engine 1 POSITION CH A - Engine 2 POSITION CH A = difference.

(k) Make sure that the difference is 0.0 ±1.0 degrees.

1) If the difference is not in the specified range, adjust one of the TLA resolvers, do this task: Thrust Lever Angle Resolver Adjustment, TASK 76-11-05-820-801-F00.

(l) If the difference is in the specified range, the test is completed.

(m) Move the two thrust levers to the idle stop.

(n) If you wish to do other tests, push the INDEX LSK several times, until the correct menu shows.

(o) To end the test, push the INIT REF key.

NOTE: This causes the test to stop and automatically removes electrical power from the EEC.

IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR

SUBTASK 73-21-00-840-009-F00

(4) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
IDC 025-999			
C	7	C01678	WEATHER RADAR RT RIGHT

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
IDC ALL; AIRPLANES WITH PREDICTIVE WINDSHEAR			
D	13	C00120	WEATHER RADAR RT

IDC ALL

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-00-700-808-F00

10. IDENT/CONFIG

A. General

(1) The Ident/Config test is used to identify the engine configuration.

(2) Each EEC channel has a dedicated screen that shows this information:

(a) Airplane model

(b) Engine Model

(c) BUMP

(d) N1 trim

(e) EEC software Part Number

(f) EEC software version number

(g) Start Mode

(h) Engine serial number

(i) PMUX INSTALLED

1) Engines without the PMUX sensors have one pneumatic line at the bottom of the EEC. Engines with the optional PMUX sensors have three pneumatic lines at the bottom of the EEC.

(j) DMS KIT INSTALLED

1) Engines with the Debris Monitoring system have electrical wiring connected to the magnetic chip detectors.

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES

(k) BSV ENABLED

IDC ALL

(l) IGNITION MODE

1) The engine start switch with the OFF position is the standard ignition. The engine start switch with the AUTO position and without the OFF position is the AUTO ignition.

(m) LPT KIT INSTALLED

1) CFM56-7BE engines have the LPT kit installed.

(3) The engine serial number is the only item that you can change with Flight Management Computer/Control Display Unit (FMCS CDU) inputs.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

D. Procedure

SUBTASK 73-21-00-210-001-F00

(1) Do these steps to get the Engine Data for the applicable engine:

(a) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

(b) Record this data from the Engine Model Plate and the Engine Data Plate:

NOTE: The Engine Model Plate and Engine Data Plate are aft of the oil tank. The Engine Data Plate is found just below the Engine Model Plate.

1) Record the CONFIG (Configuration) Number from the Engine Data Plate.

NOTE: Examples of the Configuration Number are 7B22, 7B22/B1, or 7B22/B1/2. CONFIG = _____

2) Record the N1 TRIM NUMBER from the Engine Data Plate.

NOTE: N1 TRIM = _____

3) Record the Engine Serial Number from the Engine Data Plate.

NOTE: The Engine Serial Number is a 6 digit number that may or may not have a hyphen (Example; 524-001, 524 001 or 524001). ENG S/N = _____

(c) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 73-21-00-800-001-F00

(2) Do the rest of the steps in this procedure at the FMCS CDU in the flight compartment.

SUBTASK 73-21-00-730-005-F00

(3) Do these steps to examine the IDENT/CONFIG:

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.

(b) If the FMCS CDU is not active from other EEC tests, do these steps:

1) Get access to the FMCS CDU in the flight compartment.

2) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

3) Push these line select keys (LSK) on the FMCS CDU:

a) INDEX

b) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

c) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

d) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MENU screen to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU can show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MENU shows.

(c) If the FMCS CDU is active from other engine tests, push this LSK:

1) INDEX

NOTE: This causes the ENGINE X BITE TEST Menu to show.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(d) Push the IDENT/CONFIG LSK.

NOTE: This causes Screen 1 of the IDENT/CONFIG test to show.

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

(e) Make sure that these displays show on the FMCS CDU:

1) Make sure that the AIRPLANE MODEL line shows the applicable model.

NOTE: 737-600, 737-700, 737-700IGW, 737-800, or 737-900.

IDC ALL; AIRPLANES WITH SINGLE ANNULAR COMBUSTOR (SAC) ENGINES

2) Make sure that the ENGINE MODEL display agrees with the Engine Data Plate and is acceptable for your AIRPLANE MODEL.

NOTE: An example is CFM56-7B22. The -7B22 describes the SAC engines.

a) If the engine, EEC, or engine rating plug was replaced, do this test again for the other engine at the end of this task to make sure that the same ENGINE MODEL shows for the two engines.

<1> For engine intermix, make sure that the ENGINE MODEL agrees with the configuration in the applicable intermix service bulletin.

IDC ALL

3) Compare the BUMP display with the Configuration Number, "B" number.

a) Engines with a BUMP number = 0 (Example; CFM56-7B22 where there is no "B" number in the Configuration Number. The "B" number is BLANK).

b) Engines with the BUMP number = 1 (Example: CFM56-7B22/B1, where the B1 in the Configuration Number is the "B" number).

c) Engines with the BUMP number = 2 (Example: CFM56-7B22/B2, where the B2 in the Configuration Number is the "B" number).

4) Make sure that the BUMP display and the Configuration Number, "B" number agree with the Table (below).

Table 501/73-21-00-993-801-F00

CONFIGURATION NUMBER, "B" NUMBER	BUMP
BLANK	0
B1	1
B2	2
B3	3

5) Make sure that the N1 TRIM displays agrees with the Engine Data Plate.

6) If the EEC software was replaced by a CFMI Service Bulletin, then make sure that the EEC S/W P/N (EEC Software Part Number) display agrees with the label on the Working Copy Disk.

a) If the EEC Software Part Number does not agree with the label on the Working Copy Disk, then re-install the EEC software.

NOTE: To install the EEC software please refer to the applicable CFMI Service Bulletin.

7) If the engine or EEC was replaced, make sure that the ENG S/N (serial number) display agrees with the Engine Data Plate.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) If the Serial Number is not correct, push the LSK adjacent to the ENG S/N display.

b) Enter the correct serial number on the FMCS CDU keyboard.

c) Push the CONTINUE LSK.

8) Make sure that the START MODE lines shows ENHANCED.

(f) Push the NEXT PAGE key on the FMCS CDU.

NOTE: This causes Screen 2 of the IDENT/CONFIG test to show.

(g) Make sure that the data on screen 2/2 agrees with the installed engine configuration:

1) PMUX INSTALLED: YES or NO

2) DMS KIT INSTALLED: YES or NO

3) BSV ENABLED: YES or NO

NOTE: Airplanes with S/W Part Number 1853M78P16 or later, the IDENT/CONFIG page 2 will show BSV ENABLED. If the indication is YES, then the BSV is installed and active. If the indication is NO, then the BSV is deactivated and either installed or removed.

4) IGNITION MODE: STANDARD

5) LPT KIT INSTALLED: YES for CFM56-7BE Engines.

(h) If the displays are not in the limits, do this task: EEC TEST, TASK 73-21-00-700-804-F00.

1) Do the Fault Isolation Procedures for the maintenance messages that show for the applicable system.

2) The EEC TEST does not look at these systems:

a) START MODE

b) PMUX INSTALLED

c) DMS KIT INSTALLED

d) LPT KIT INSTALLED.

(i) To end the test, push the INIT REF key.

NOTE: This causes the test to stop and automatically removes electrical power from the EEC.

——— END OF TASK ———

TASK 73-21-00-700-809-F00

11. EEC Discretes Test

A. General

(1) This test examines the EEC to make sure that it receives the reset signal before an engine start.

(2) This test also makes sure that the Alternate Mode switch operates correctly.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

C. Procedure

SUBTASK 73-21-00-840-002-F00

(1) Do these steps to prepare for the procedure:

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.

(b) Do these steps to prepare for the CH A EEC Discretes Test:

1) For engine 1, do this step:

Open these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

2) For engine 2, do this step:

Open these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

3) Make sure that the Engine START LEVER, for the applicable engine, is in the CUTOFF position.

SUBTASK 73-21-00-730-006-F00

(2) Do these steps to do the CH A EEC Discretes Test:

NOTE: The Ch B circuit breaker is open, which permits only Ch A data to show.

(a) Get access to the FMCS CDU in the flight compartment.

(b) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

(c) Push these line select keys (LSK) on the FMCS CDU:

1) INDEX

2) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

(d) Push these line select keys (LSK) on the FMCS CDU:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

2) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

3) INPUT MONITORING

NOTE: This LSK causes the ENGINE X INPUT MONITORING TEST FOR CH A ONLY to show.

4) CONTINUE

NOTE: This LSK causes the INPUT MONITORING NOTICE SCREEN to show.

5) CONTINUE

NOTE: This LSK causes Screen 1 of the INPUT MONITORING Menu to show.

(e) Push the NEXT PAGE key.

NOTE: The NEXT PAGE key is below the FMCS CDU screen, above the numeric key pad. The NEXT PAGE key causes Screen 2 of the INPUT MONITORING Menu to show.

(f) Push the DISCRETES LSK.

NOTE: This LSK causes Screen 1 of the GMM DISCRETES to show.

(g) Make sure that the ALTN MODE SW display shows OFF.

(h) Set the applicable engine EEC MODE Switch, on the Power Management Control panel (P5), to ALTN.

1) Make sure that the ALTN MODE SW display shows ON.

(i) Set the applicable engine EEC MODE Switch to ON.

1) Make sure that the ALTN MODE SW display shows OFF.

(j) Make sure that the START LEVER POS display shows CUTOFF.

(k) Move the applicable Engine START LEVER to the IDLE position.

1) Make sure that the START LEVER POS display shows IDLE.

(l) Press the INIT REF key.

(m) Move the applicable Engine START LEVER to the CUTOFF position.

NOTE: This will stop the test and remove the electrical power from the EEC.

SUBTASK 73-21-00-840-003-F00

(3) Do these steps to prepare for the CH B EEC Discretes Test:

(a) For engine 1, do this step:

1) Close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

1) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B

2) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-00-730-007-F00

(4) Do these steps to do the CH B EEC Discretes Test:

NOTE: The Ch A circuit breaker is open, which permits only Ch B data to show.

(a) Get access to the FMCS CDU in the flight compartment.

(b) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

(c) Push these LSKs on the FMCS CDU:

1) INDEX

2) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

(d) Push these LSKs on the FMCS CDU:

1) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

2) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

3) INPUT MONITORING

NOTE: This LSK causes the ENGINE X INPUT MONITORING TEST FOR CH B ONLY to show.

4) CONTINUE

NOTE: This LSK causes the INPUT MONITORING NOTICE SCREEN to show.

5) CONTINUE

NOTE: This LSK causes Screen 1 of the INPUT MONITORING Menu to show.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Push the NEXT PAGE key.

NOTE: The NEXT PAGE key is below the FMCS CDU screen, above the numeric key pad. The NEXT PAGE key causes Screen 2 of the INPUT MONITORING Menu to show.

(f) Push the DISCRETES LSK.

NOTE: This LSK causes Screen 1 of the GMM DISCRETES to show.

(g) Make sure that the ALTN MODE SW display shows OFF.

(h) Set the applicable engine EEC MODE Switch, on the Power Management Control panel (P5), to ALTN.

1) Make sure that the ALTN MODE SW display shows ON.

(i) Set the applicable engine EEC MODE Switch to ON.

1) Make sure that the ALTN MODE SW display shows OFF.

(j) Make sure that the START LEVER POS display shows CUTOFF.

(k) Move the applicable Engine START LEVER to the IDLE position.

(l) Make sure that the START LEVER POS display shows IDLE.

(m) Press the INIT REF key.

(n) Move the applicable Engine START LEVER to the CUTOFF position.

NOTE: This will stop the test and remove the electrical power from the EEC.

SUBTASK 73-21-00-840-004-F00

(5) For engine 1, do this step:

Close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 73-21-00-840-005-F00

(6) For engine 2, do this step:

Close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-00-800-801-F00

12. Erase All EEC Faults

A. General

(1) This task will erase all of the faults that are stored in Recent Faults, Fault History, and will reset the HPTACC thermal history that is stored in Non-Volatile Memory (NVM) to zero.

(a) Once this task is initialized there are no other options, all five EEC memory zones are set to zero. The memory will be erased and the data will be lost.

(2) Do this task after you replace the EEC or the engine.

B. References

Reference	Title
FIM 73-05 TASK 803	CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 73-21-00-710-002-F00

(1) Do these steps to get access to the IDENT/CONFIG page:

(a) If not already done, do this task: Prepare for the Tests, TASK 73-21-00-840-801-F00.

(b) If the FMCS CDU is not active from other EEC tests, do these steps:

1) Get access to the FMCS CDU in the flight compartment.

2) Press the INIT REF key to show the PERF INIT screen on the FMCS CDU.

NOTE: The FMCS CDU does not support a type-ahead function. You must have the prompt on the FMCS CDU screen before you type in the response.

3) Push these line select keys (LSK) on the FMCS CDU:

a) INDEX

b) MAINT

NOTE: This LSK causes the MAINT BITE INDEX screen to show.

c) ENGINE

NOTE: This LSK causes the ENGINE/EXCEED BITE INDEX screen to show.

d) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MENU screen to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU can show INITIALIZING EEC X and EEC SORTING FAULT HISTORY DATA for a short time, just before the ENGINE X BITE TEST MENU shows.

(c) IDENT/CONFIG LSK

NOTE: This causes Screen 1 of the IDENT/CONFIG to show.

1) If the FOR CH A ONLY or FOR CH B ONLY screen shows, then, do this task: CH A (B) EEC DATA NOT AVAILABLE - Fault Isolation, FIM 73-05 TASK 803.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-00-070-001-F00

(2) Push the ERASE LSK

NOTE: This will cause the IDENT/CONFIG ERASE screen to show.

(a) Type "OK" on the FMCS CDU keyboard.

CAUTION

ONCE YOU PUSH THE "ERASE ALL" LSK YOU CAN NOT STOP THE PROCEDURE. DO NOT PUSH THE "INIT REF" KEY OR REMOVE THE ELECTRICAL POWER FROM THE EEC WHILE THE "EEC ERASING FAULTS" SCREEN SHOWS. IF YOU DO NOT FOLLOW THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE MEMORY IN THE EEC.

(b) Push the ERASE ALL LSK.

NOTE: This will cause the EEC ERASING FAULTS screen to show.

(c) After the EEC ERASING FAULTS screen goes away, push the INIT REF key to end the procedure.

NOTE: This will remove the electrical power from the EEC.

——— END OF TASK ———

TASK 73-21-00-700-810-F00

13. FADEC 2 or FADEC 3 Identification

A. General

(1) The FADEC 2 or FADEC 3 Identification task is used to identify the FADEC version.

(2) There are two ways to identify the FADEC version:

(a) By the EEC software part number or

(b) By the EEC hardware part number.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Procedure

SUBTASK 73-21-00-700-001-F00

(1) To identify the FADEC version, do the EEC software check or the EEC hardware check that follows.

SUBTASK 73-21-00-740-005-F00

(2) Do these steps to identify the FADEC version by the EEC software part number:

(a) Do this task (IDENT/CONFIG, TASK 73-21-00-700-808-F00).

(b) Record the EEC software part number.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) The EEC software part number for FADEC 2 is 1853M78PXX.
2) The EEC software part number for FADEC 3 is 2044M25PXX.

SUBTASK 73-21-00-212-001-F00

(3) Do these steps to identify the FADEC version by the EEC hardware part number:
   (a) Do this task (Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00).
   (b) Find the EEC on the right side of the fan case at the 2 o'clock position.
   (c) Record the EEC hardware part number.
      1) The EEC hardware part number for FADEC 2 is:
         a) 1853M33PXX
      2) The EEC hardware part number.for FADEC 3 is:
         a) 2042M67PXX
   (d) Do this task (Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

PT25 SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) PT25 sensor Removal

(2) PT25 sensor Installation.

TASK 73-21-02-000-801-F00

2. PT25 Sensor Removal

(Figure 401)

A. General

(1) This task provides the instructions on how to remove the PT25 sensor.

(2) Each engine has one PT25 sensor.

(3) The PT25 sensor is behind the bleed air deflector panel, between the fan frame struts between the 6:00 and 7:00 o'clock positions.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
72-23-03-000-802-F00	Shroud Segments Removal (P/B 401)
72-23-07-000-801-F00	Fan Duct Panel Removal (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-21-02-840-001-F00

(1) Prepare for the removal:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-02-010-001-F00

(2) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:

WARNING DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Do this task: Thrust Reverser Deactivation for Ground Maintenance, TASK 78-31-00-040-802-F00.

(b) Open the left and right fan cowl panels (TASK 71-11-02-010-801-F00).

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Open the left and right thrust reversers (TASK 78-31-00-010-801-F00).

SUBTASK 73-21-02-020-002-F00

(3) Remove the lower left extension ring panel [2] (TASK 72-23-03-000-802-F00).

NOTE: Extension ring panel [2] is on the left side of the engine, between the struts at the 6:00 and 9:00 o'clock positions.

SUBTASK 73-21-02-020-003-F00

(4) Remove the fan duct panel [1] (TASK 72-23-07-000-801-F00).

NOTE: Fan duct panel [1] is between the fan frame struts at the 6:00 and 7:00 o'clock positions.

E. PT25 Sensor Removal

SUBTASK 73-21-02-020-001-F00

(1) Remove the PT25 Sensor [14] as follows:

(a) Disconnect the J9 electrical connector [10] and the J10 electrical connector [9] from the T25 receptacle [12] (DP0910) and the T25 receptacle [13] (DP1009).

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

(b) Disconnect the P25 tube [8] from the pressure tube nipple [3].

IDC ALL PRE SB CFM56-7B-72-149

(c) Loosen the P25 nipple nut [6] from the P25 pressure tube nipple [3].

IDC ALL POST SB CFM56-7B-72-149

(d) Loosen the P25 nipple nut [6] from the P25 pressure tube nipple [3] and remove the washer [19].

IDC ALL

(e) Loosen the captive bolt [16].

(f) Disconnect the P25 pressure tube [15] from the flange of the PT25 sensor [14]. Then, remove the P25 nipple nut [6].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(g) Disconnect the pressure tube nipple [3] from the fan frame bulkhead and remove P25 pressure tube [15].

1) Remove and discard the O-ring [17].

(h) Remove the two bolts [7].

(i) Remove the bracket [5].

(j) Remove the T25 connector nuts [11].

(k) Push the bracket [4] up to disengage it from the T25 receptacles.

1) Remove the bracket [4].

(l) Remove the two T25 receptacle [12] (DP0910) and the T25 receptacle [13] (DP1009) from the fan frame bulkhead.

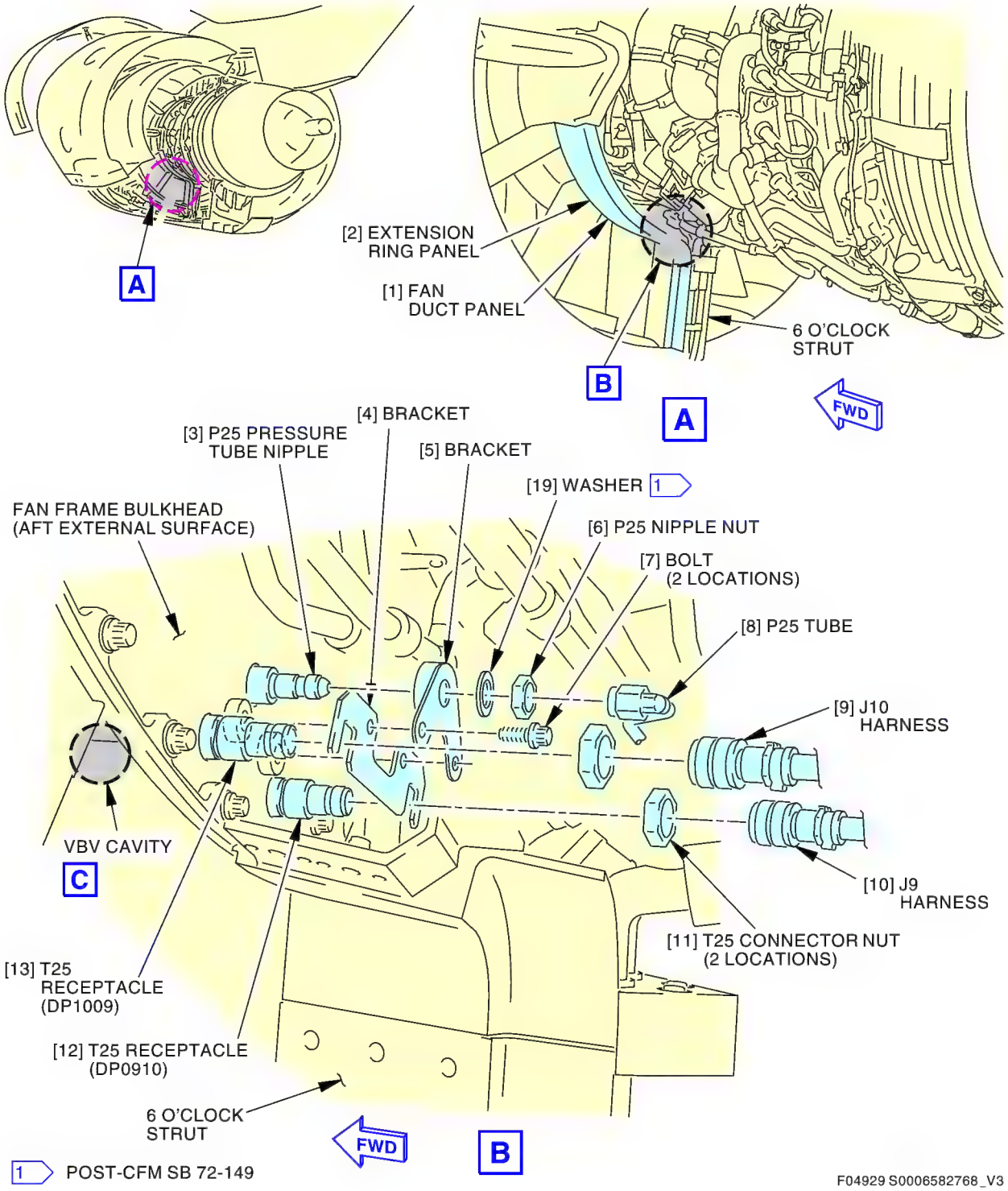
(m) Loosen the three captive bolts [18] on the flange of the PT25 sensor [14].

(n) Remove the PT25 sensor [14] from the VBV cavity.

(o) Install the protective covers on the PT25 sensor [14], the electrical connector [9], the electrical connector [10], the T25 receptacle [12], the T25 receptacle [13], the tube [3], the tube[8], and the tube [15].

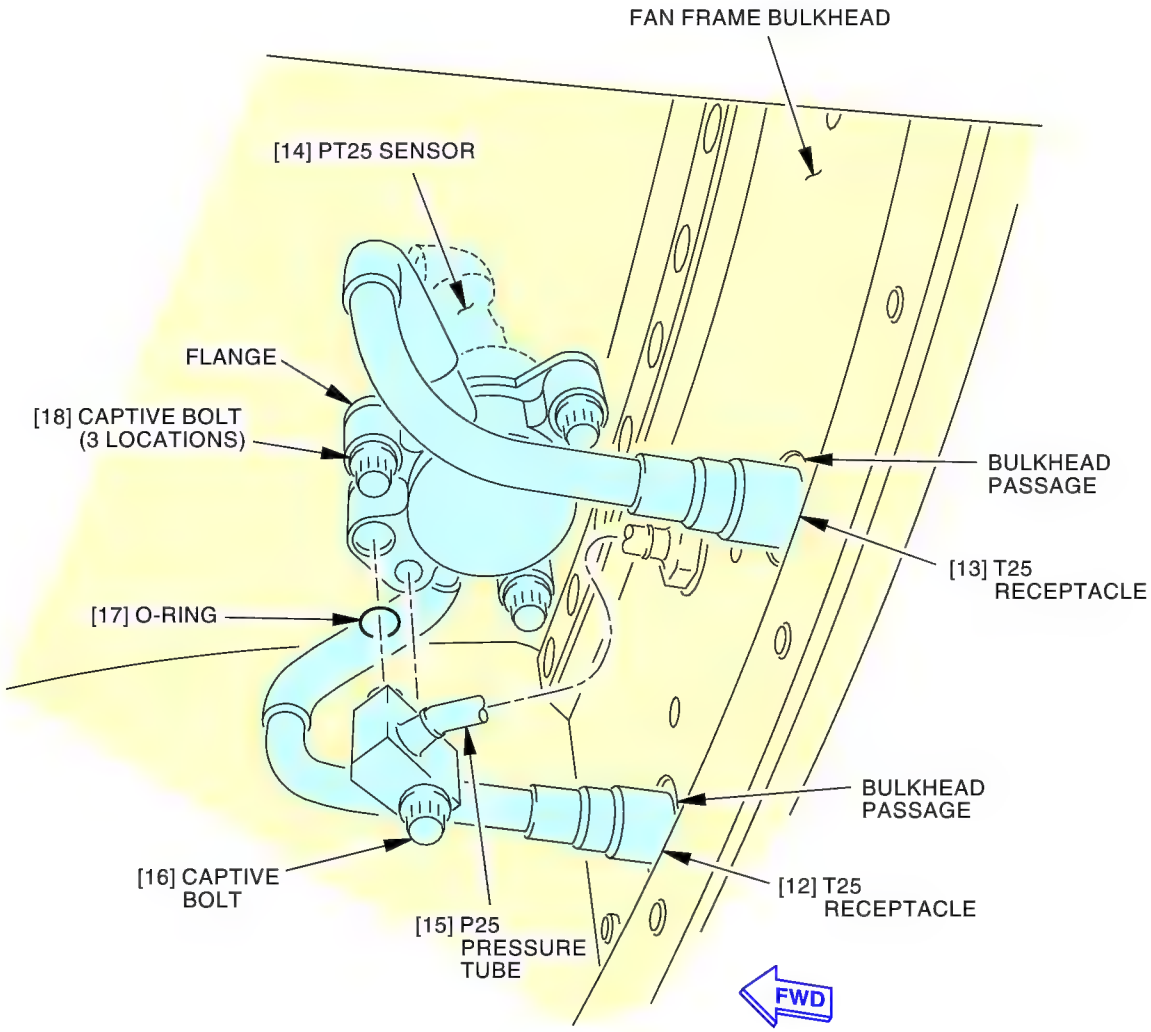
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



PT25 Sensor Installation
Figure 401/73-21-02-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



PT25 Sensor Installation
Figure 401/73-21-02-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-02-400-801-F00

3. PT25 Sensor Installation

(Figure 401)

A. General

(1) This task provides the instructions on how to install the PT25 sensor.

B. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
72-23-03-400-802-F00	Shroud Segments Installation (P/B 401)
72-23-07-400-801-F00	Fan Duct Panel Installation (P/B 401)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A50012 [CP2242]	Adhesive - Silicone, Thixotropic Paste, One-Part RTV - RTV 732	CFM CP2242, MIL-A-46106 Type I
B01058 [CP1039]	Solvent - Acetone, Reagent Grade	
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
14	PT25 Sensor	73-21-02-01-010	IDC 001-010, 012-999
17	O-ring	73-21-02-01-035	IDC 001-010, 012-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 73-21-02-860-001-F00

(1) Remove the protective covers from the PT25 sensor [14], the electrical connector [9], the electrical connector [10], the T25 receptacle [12], the T25 receptacle [13], the tube [3], the tube[8], and the tube [15].

SUBTASK 73-21-02-840-002-F00

(2) Do these steps to prepare for the installation:

(a) Use acetone solvent, B01058 [CP1039] to degrease the two bulkhead passages of the T25 receptacle [12] and the T25 receptacle [13].

(b) Make sure that the component interfaces are clean and in good condition.

(c) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the captive bolt [16] and the captive bolt [18].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

G. PT25 Sensor Installation

SUBTASK 73-21-02-420-001-F00

(1) Install the PT25 sensor [14] as follows:

> **WARNING** DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(a) Lubricate a new O-ring [17] with oil, D00623 [CP5066].

1) Install the O-ring [17] on the P25 pressure tube [15].

(b) Put the PT25 Sensor [14] in its correct position in the VBV cavity.

1) Tighten the three captive bolts [18] to 110-121 pound-inches (12.5-13.5 Newton meters).

(c) Install the two T25 receptacles [12] (DP0910) and the T25 receptacle [13] (DP1009) through the fan frame bulkhead.

(d) Install bracket [4] to lock the T25 receptacles [12] and [13] in their positions.

(e) Put the P25 pressure tube nipple [3] through its passage in the fan frame bulkhead.

(f) Put the bracket [5] into its position on the P25 pressure tube nipple [3].

1) Make sure that the rubber side of the bracket [5] is towards the fan frame bulkhead.

(g) Install the two bolts [7] to hold the brackets [4] and [5] in their correct positions.

1) Tighten the bolts [7] to 97-115 pound-inches (11-13 Newton meters).

(h) Lubricate the threads of the P25 pressure tube nipple [3] with oil, D00623 [CP5066].

IDC ALL POST SB CFM56-7B-72-149

(i) Install the washer [19].

IDC ALL

(j) Install and tighten the P25 nipple nut [6] to 135-150 pound-inches (15-17 Newton meters).

(k) Connect the P25 pressure tube [15] to the flange of the PT25 sensor [14] with the captive bolt [16].

NOTE: Do not tighten the bolt [16] at this time.

(l) Connect the P25 pressure tube [15] to the P25 pressure tube nipple [3].

> **CAUTION** USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

1) Use two wrenches to tighten the nipple [3] and the P25 pressure tube [15] to 135-150 pound-inches (15-17 Newton meters).

(m) Tighten the bolt [16] to 97-115 pound-inches (11-13 Newton meters).

(n) Connect the T25 receptacle [12] and the T25 receptacle [13] to the bracket assembly [4] with the two T25 connector nuts [11].

1) Tighten the T25 connector nuts [11] to 62-71 pound-inches (7-9 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(o) Apply RTV 732 adhesive, A50012 [CP2242] to the two bulkhead passages of the T25 receptacle [12] and the T25 receptacle [13], to seal the bulkhead passages.

(p) Connect the P25 tube [8] to the P25 pressure tube nipple [3].

NOTE: Hand tighten at this time.

(q) Use two wrenches to tighten the P25 tube [8] to the P25 pressure tube nipple [3] to 98-110 pound-inches (11-12.5 Newton meters).

(r) Connect the J9 electrical connector [10] to the T25 receptacle [12] (DP0910).

(s) Connect the J10 electrical connector [9] to the T25 receptacle [13] (DP1009).

H. PT25 Sensor Installation Test

SUBTASK 73-21-02-720-001-F00

(1) Do these steps for the PT25 sensor installation test:

(a) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00)

I. Put the Airplane Back to Its Usual Condition

SUBTASK 73-21-02-420-002-F00

(1) Install the fan duct panel [1] (TASK 72-23-07-400-801-F00).

SUBTASK 73-21-02-420-003-F00

(2) Install the lower left extension ring panel [2] (TASK 72-23-03-400-802-F00).

SUBTASK 73-21-02-410-001-F00

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do these tasks in sequence to safely close the left and right thrust reversers:

(a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

(b) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(c) Do this task: Thrust Reverser Activation after Ground Maintenance, TASK 78-31-00-440-803-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

T12 SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks as follows:

(1) The removal of the T12 sensor

(2) The installation of the T12 sensor.

TASK 73-21-05-000-801-F00

2. T12 Sensor Removal

(Figure 401)

A. General

(1) This task is the removal task for the T12 sensor. The sensor is behind an access door on the inlet cowl at the 2:30 o'clock position.

B. Location Zones

Zone	Area
412	Engine 1 - Nose Inlet Cowl
422	Engine 2 - Nose Inlet Cowl

C. Access Panels

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

D. Prepare for the Removal

SUBTASK 73-21-05-840-001-F00

(1) Do these steps to prepare for the procedure:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do this step:

Open the applicable T12 access panels on the inlet cowl:

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. T12 Sensor Removal

SUBTASK 73-21-05-020-002-F00

(1) Do these steps to remove the T12 sensor [1]:

(a) Disconnect the T12 Channel A sensor connector [9] from the J7 harness receptacle [10] (DP0704).

(b) Disconnect the T12 Channel B sensor connector [8] from the J8 harness receptacle [7] (DP0804).

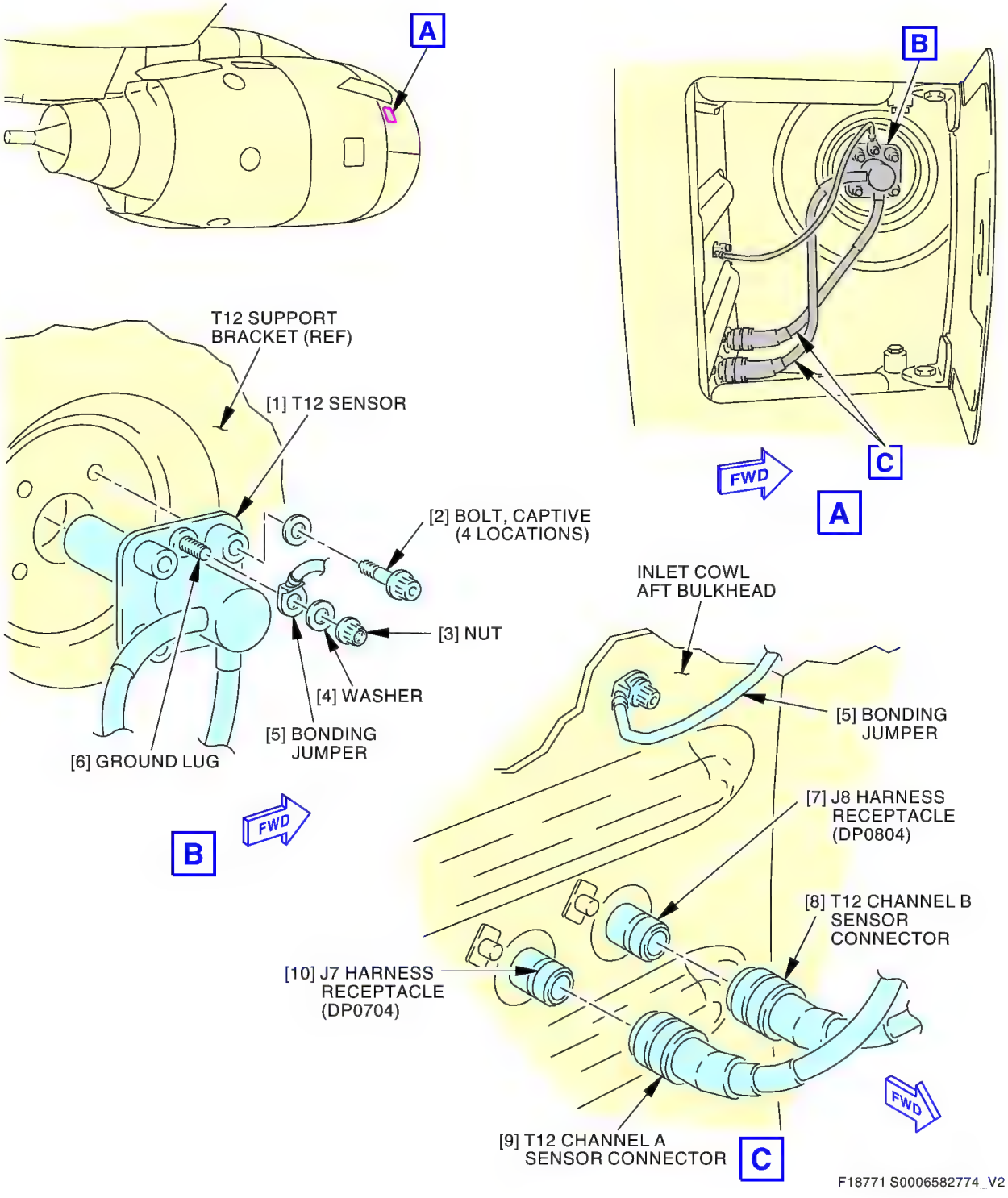
(c) Remove the nut [3] and washer [4] to disconnect the bonding jumper [5] from the T12 sensor [1].

(d) Loosen the four captive bolts [2] that hold the T12 sensor [1] to the inlet cowl.

1) Remove the T12 sensor [1] from the inlet.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



T12 Sensor Installation
Figure 401/73-21-05-990-802-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-05-400-801-F00

3. T12 Sensor Installation

(Figure 401)

A. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
SWPM Ch 20	Standard Wiring Practices Manual

B. Tools/Equipment

Reference	Description
STD-1081	Flashlight - Explosion Proof

C. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00625 [CP2338]	Grease - Conductive - Brisal OX	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	T12 sensor	73-21-05-01-055	IDC 001-006
		73-21-05-01A-080	IDC 007-010, 012-999

E. Location Zones

Zone	Area
412	Engine 1 - Nose Inlet Cowl
422	Engine 2 - Nose Inlet Cowl

F. Access Panels

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

G. Prepare for the Installation

SUBTASK 73-21-05-840-002-F00

(1) Use an explosion proof flashlight, STD-1081, to visually examine these areas:

(a) Make sure that the sensor connectors and harness receptacles are clean and in good condition.

(b) Make sure that the bonding jumper [5], terminal of the ground lug [6], washer [4], and nut [3] are clean and in good condition.

(c) Make sure that the mounting surface of the T12 sensor [1] support bracket is clean and in good condition.

(d) Make sure that the shock mount surface of the T12 sensor [1] is clean and smooth.

SUBTASK 73-21-05-840-004-F00

(2) Lubricate the threads of the captive bolts [2] with graphite mineral vaseline, D00601 [CP2101].

SUBTASK 73-21-05-640-001-F00

(3) Lubricate the bonding jumper [5], ground lug [6] terminal, washer [4], and nut [3] with Brisal OX grease, D00625 [CP2338].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

H. T12 Sensor Installation

SUBTASK 73-21-05-420-001-F00

(1) Put the T12 sensor [1] in its correct position on the inlet.

(a) Tighten the captive bolts [2] to 38 in-lb (4.3 N·m) - 42 in-lb (4.7 N·m).

SUBTASK 73-21-05-420-002-F00

(2) Install the bonding jumper [5] on the ground lug [6] with the washer [4] and nut [3].

(a) Make sure that the Brisal OX grease, D00625 [CP2338], is applied to all of the mating surfaces of the jumper parts.

(b) Tighten the nut [3] to 38 in-lb (4.3 N·m) - 42 in-lb (4.7 N·m).

SUBTASK 73-21-05-420-003-F00

(3) Connect the T12 channel B sensor connector [8] to the J8 harness receptacle (DP0804) [7].

SUBTASK 73-21-05-420-004-F00

(4) Connect the T12 channel A sensor connector [9] to the J7 harness receptacle (DP0704) [10].

SUBTASK 73-21-05-840-003-F00

(5) Do the electrical bonding resistance check on the bonding jumper [5] (SWPM Ch 20).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 73-21-05-410-001-F00

(1) Close the applicable access panels:

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

SUBTASK 73-21-05-860-001-F00

(2) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 73-21-05-860-002-F00

(3) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-05-700-001-F00

(4) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

T12 SENSOR - INSPECTION/CHECK

1. General

A. This procedure contains the inspection of the T12 sensor.

TASK 73-21-05-200-801-F00

2. T12 Sensor Inspection/Check

(Figure 601)

A. References

Reference	Title
73-21-05-000-801-F00	T12 Sensor Removal (P/B 401)
73-21-05-400-801-F00	T12 Sensor Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-3911	Brush - Bristle, Medium Nylon

C. Location Zones

Zone	Area
412	Engine 1 - Nose Inlet Cowl
422	Engine 2 - Nose Inlet Cowl

D. Access Panels

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

E. T12 Sensor Inspection

SUBTASK 73-21-05-210-001-F00

(1) From the inlet cowl, visually examine the T12 sensor [1] for damage:

(a) Cracks

1) Cracks are not serviceable.

a) Replace the T12 sensor.

These are the tasks:

T12 Sensor Removal, TASK 73-21-05-000-801-F00,

T12 Sensor Installation, TASK 73-21-05-400-801-F00.

(b) Nicks, Dents, and Scratches.

1) Nicks, dents, and scratches are serviceable if the depth is less than or equal to 0.03 inches (0.7 mm).

2) If the nicks, dents, or scratches are not in the limit, replace the T12 Sensor.

These are the tasks:

T12 Sensor Removal, TASK 73-21-05-000-801-F00,

T12 Sensor Installation, TASK 73-21-05-400-801-F00.

(c) Dirt build-up in the air inlet or exit slots

1) Blockage of the air passages is not serviceable.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) Use a solution of water, household detergent and medium nylon bristle brush, STD-3911 to clean the air inlet and exit slots.

b) Rinse the area with clean water.

(d) Visually examine the T12 electrical connectors:

1) Do this step:

Open the applicable T12 access panels on the inlet cowl:

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

2) Make sure that the J7 and J8 harness connectors and the J7 and J8 receptacles are clean, free of damage, and are correctly connected.

a) If it is necessary clean the J7 and J8 harness connectors and receptacles.

b) If the J7 or J8 harness connector is damaged, then repair it.

c) If the J7 or J8 receptacle is damaged, then replace the T12 sensor.

These are the tasks:

T12 Sensor Removal, TASK 73-21-05-000-801-F00,

T12 Sensor Installation, TASK 73-21-05-400-801-F00.

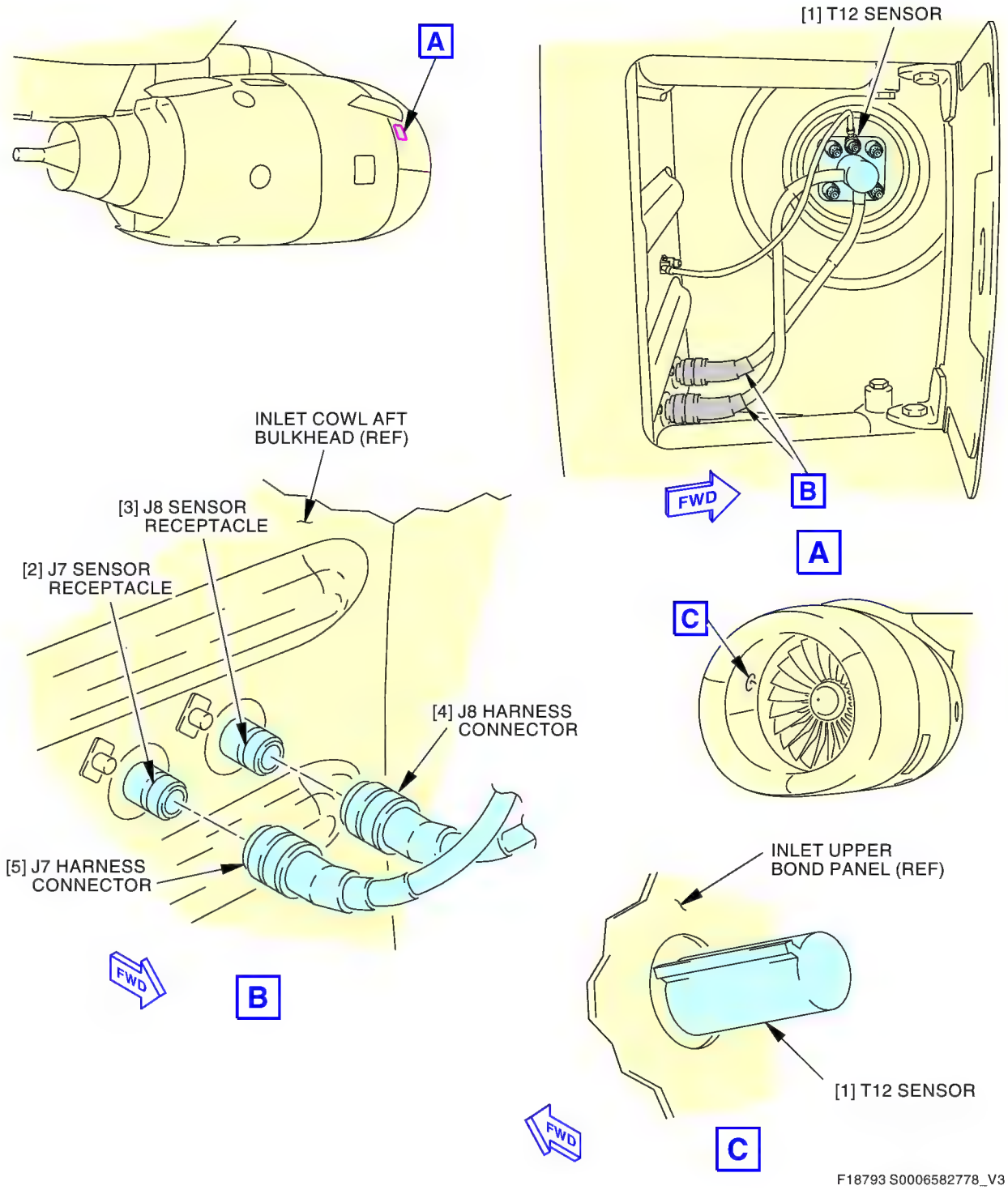
3) Do this step:

Close the applicable access panels:

Number	Name/Location
412AR	T12 Access Door, Engine 1
422AR	T12 Access Door, Engine 2

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



T12 Sensor Inspection/Check
Figure 601/73-21-05-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WIRING HARNESSES - REMOVAL/INSTALLATION

1. General

A. This procedure contains six tasks:

(1) The removal of the fan wiring harnesses (J5, J6, J7 and J8 harnesses)

(2) The installation of the fan wiring harnesses (J5, J6, J7 and J8 harnesses)

(3) The removal of the 3:00 o'clock strut harnesses

(4) The installation of the 3:00 o'clock strut harnesses

(5) The removal of the core engine harnesses

(6) The installation of the core engine harnesses.

TASK 73-21-06-000-801-F00

2. Fan Wiring Harness Removal

(Figure 401, Figure 402, Figure 403, Figure 404)

A. General

(1) The fan wiring harnesses are the J5, J6, J7 and J8 harnesses.

B. References

Reference	Title
70-70-01-200-801-F00	Standard Engine Wiring and Equipment Check (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Procedure

SUBTASK 73-21-06-840-001-F00

(1) Do these steps to prepare for the removal:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Fan Wiring Harnesses Removal

SUBTASK 73-21-06-020-001-F00

(1) Do these steps to remove the J5 harness (Figure 401):

(a) If you find fuel wetting or leakage, refer to this task, Standard Engine Wiring and Equipment Check, TASK 70-70-01-200-801-F00.

(b) Disconnect these J5 harness connectors from the receptacles at these locations:

1) EEC, J5 - DP0505
2) HMU Ch A, DP0501
3) Fuel flowmeter, DP0502
4) N2 sensor Ch A, DP0503.

(c) Open the 1/4-turn hinge clamps that hold the J5 harness [1].

(d) Remove the nuts, bolts, washers, and clamps that hold the J5 harness [1] to the fan case.

NOTE: Make a note of the locations and orientation of all of the parts that hold the J5 harness [1]. The part location and orientation is important for the subsequent installation.

(e) Disengage the J5 harness from the spring clips.

(f) Carefully remove the J5 harness [1] from the engine.

SUBTASK 73-21-06-020-002-F00

(2) Do these steps to remove the J6 harness [2] (Figure 402):

(a) If you find fuel wetting or leakage, refer to this task, Standard Engine Wiring and Equipment Check, TASK 70-70-01-200-801-F00.

(b) Disconnect these J6 harness connectors from the receptacles at these locations:

1) EEC, J6 - DP0606
2) HMU Ch B, DP0601
3) Oil temperature sensor, DP0602
4) N2 sensor Ch B, DP0603.

(c) Open the 1/4-turn hinge clamps that hold the J6 harness [2].

(d) Remove the nuts, bolts, washers, and clamps that hold the J6 harness [2] to the fan case.

NOTE: Make a note of the locations and orientation of all of the parts that hold the J6 harness. The part location and orientation is important for the subsequent installation.

(e) Disengage the J6 harness from the spring clips.

(f) Carefully remove the J6 harness [2] from the engine.

SUBTASK 73-21-06-020-003-F00

(3) Do these steps to remove the J7 harness [3] (Figure 403):

(a) Disconnect these J7 harness connectors from the receptacles:

1) EEC, J7 - DP0707
2) N1 sensor Ch A, DP0701
3) Alternator Ch A, DP0702
4) Oil filter Bypass Warning, DP0703

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

5) T12 sensor Ch A, DP0704
6) Oil pressure sensor Ch A, DP0705.

(b) Open the 1/4-turn hinge clamps that hold the J7 harness [3].

(c) Remove the nuts, bolts, washers, and clamps that hold the J7 harness [3] to the fan case.

NOTE: Make a note of the locations and orientation of all of the parts that hold the J7 harness. The part location and orientation is important for the subsequent installation.

(d) Disengage the J7 harness from the spring clips.

(e) Carefully remove the J7 harness [3] from the engine.

SUBTASK 73-21-06-020-004-F00

(4) Do these steps to remove the J8 harness [4] (Figure 404):

(a) Disconnect these J8 harness connectors from the receptacles.

1) EEC, J8 - DP0808
2) N1 sensor Ch B, DP0801
3) Alternator Ch B, DP0802
4) Fuel Filter Bypass Warning, DP0803
5) T12 sensor Ch B, DP0804
6) Oil pressure sensor Ch B, DP0805
7) DPM box, DP0806.

(b) Open the 1/4-turn hinge clamps that hold the J8 harness [4].

(c) Remove the nuts, bolts, washers, and clamps that hold the J8 harness [4] to the fan case.

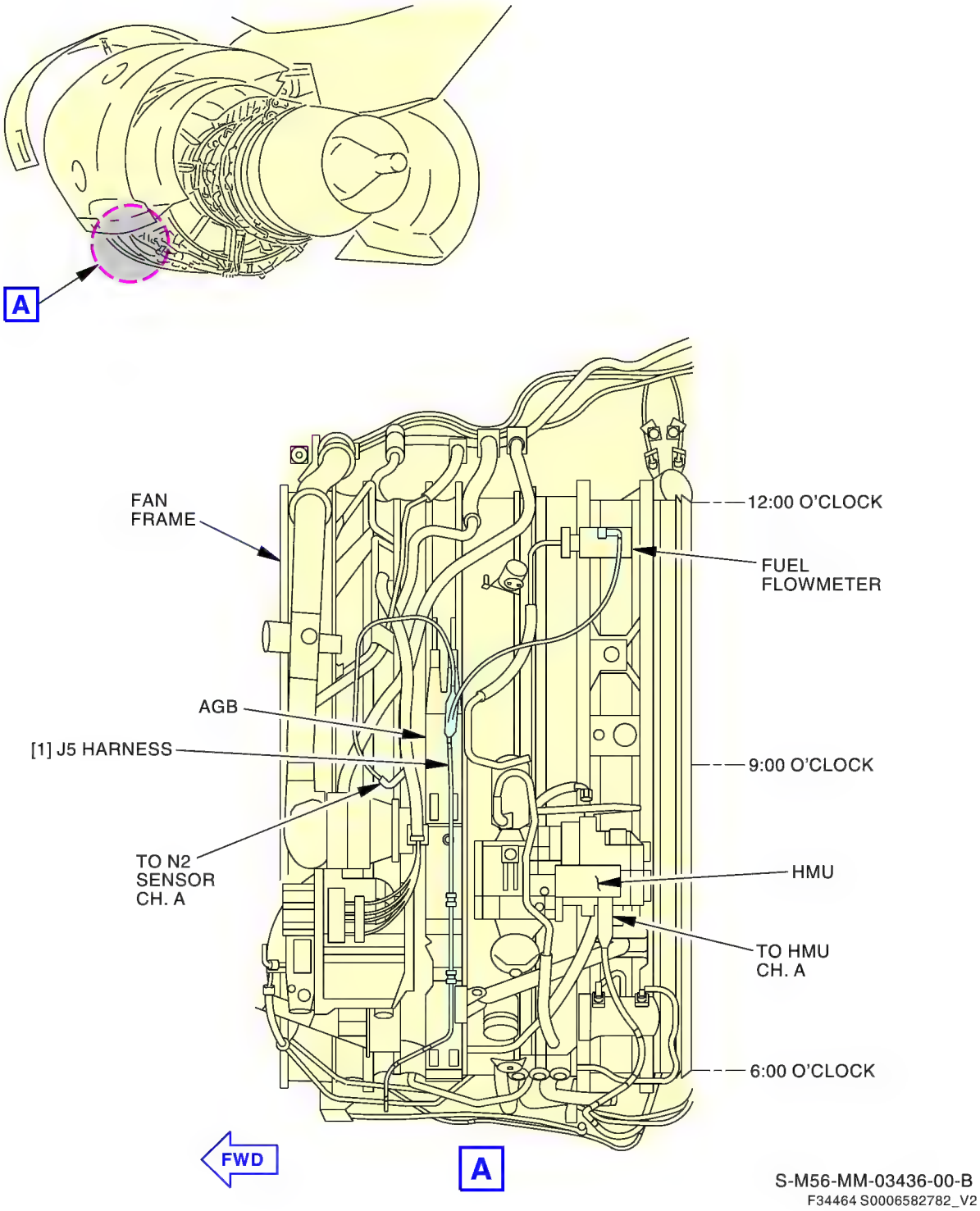
NOTE: Make a note of the locations and orientation of all of the parts that hold the J8 harness. The part location and orientation is important for the subsequent installation.

(d) Disengage the J8 harness from the spring clips.

(e) Carefully remove the J8 harness [4] from the engine.

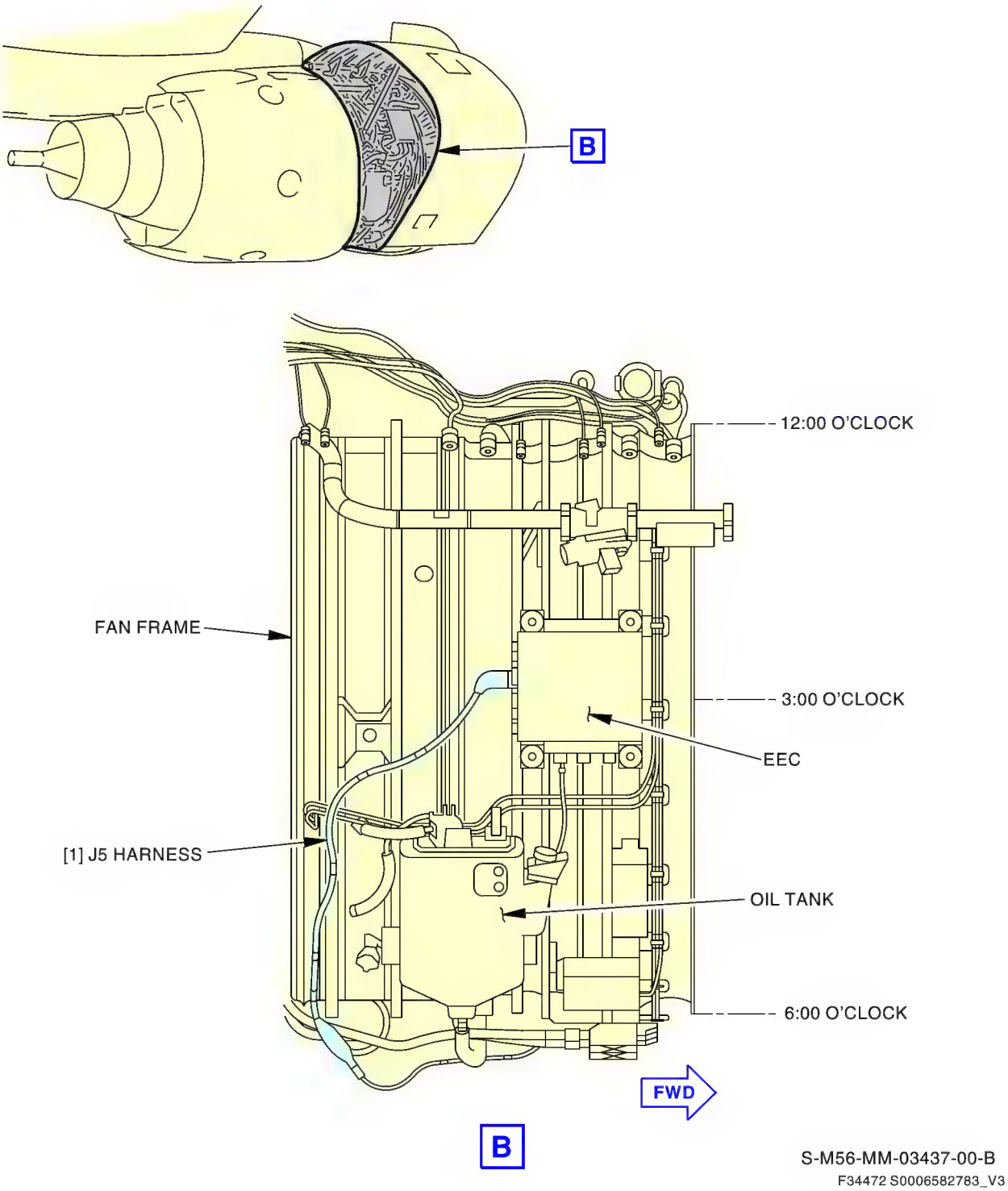
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



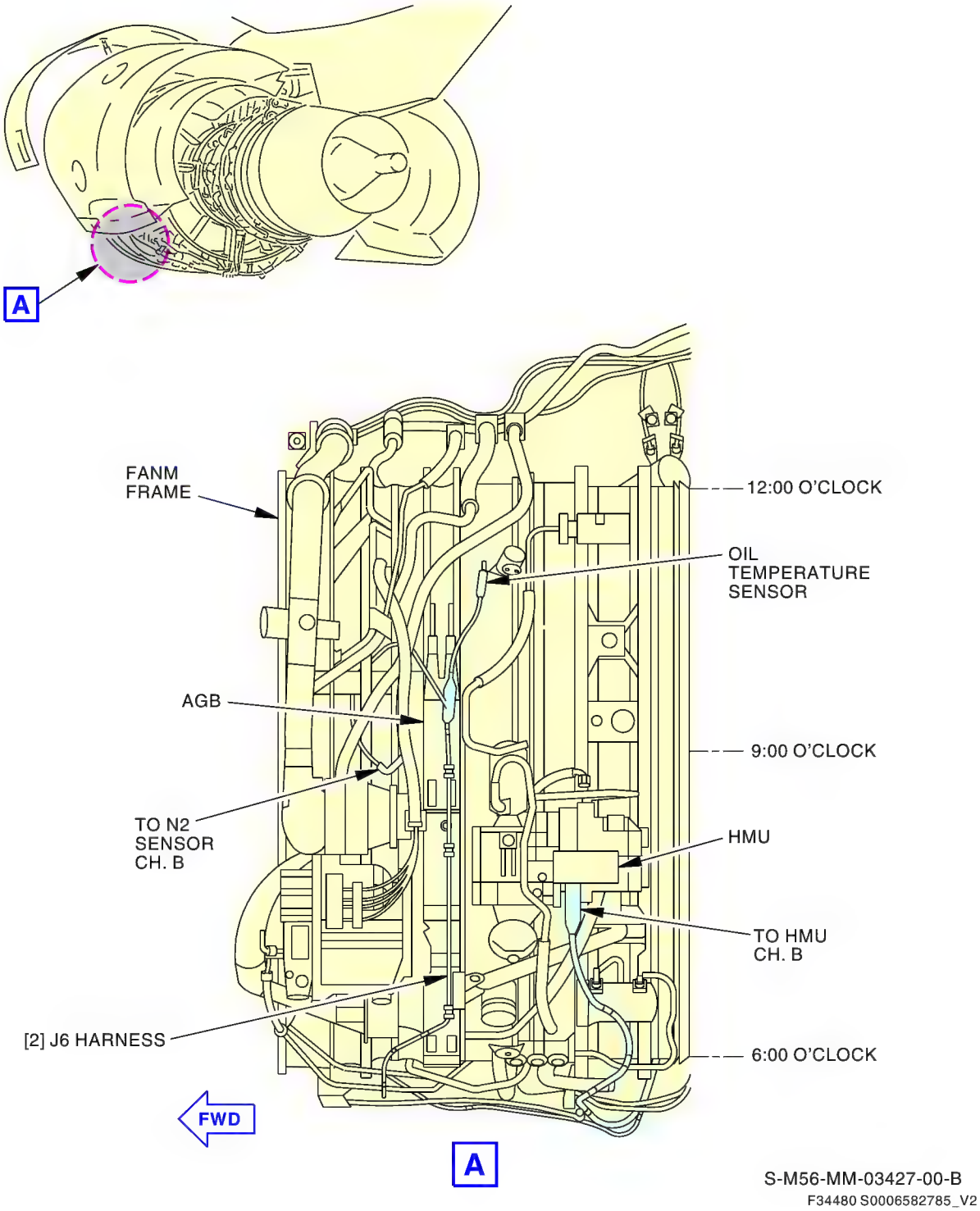
J5 Harness Installation
Figure 401/73-21-06-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



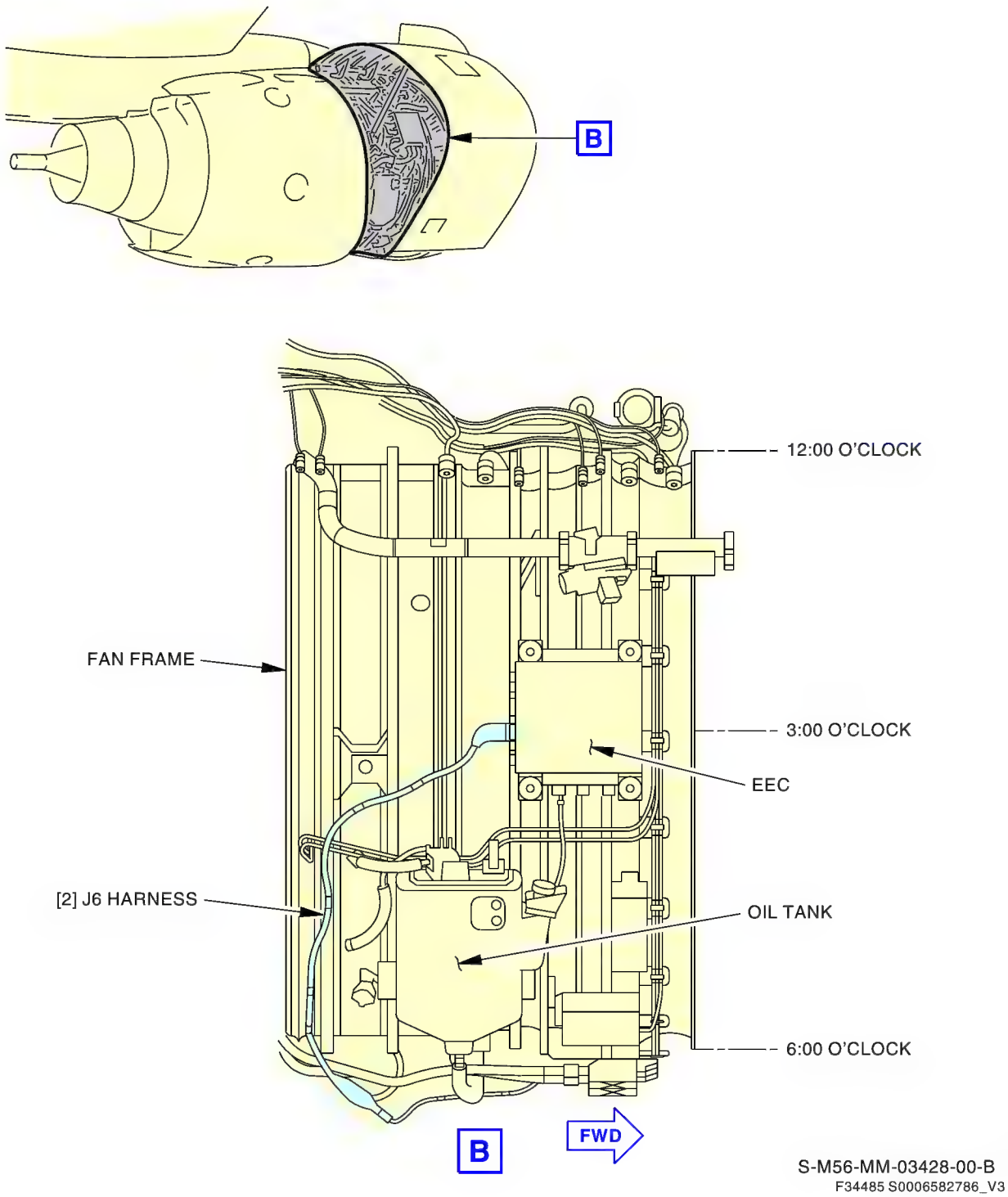
J5 Harness Installation
Figure 401/73-21-06-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



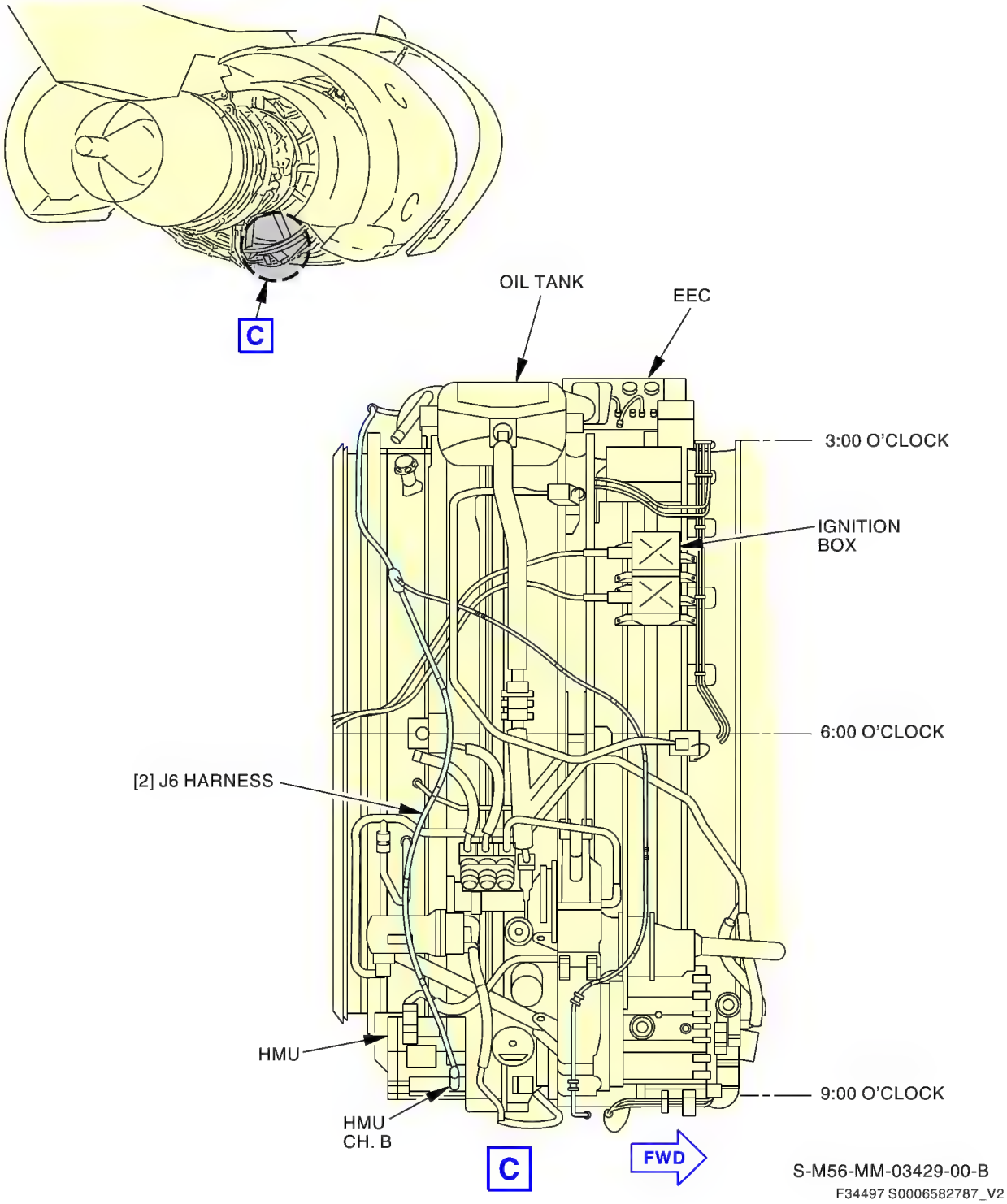
J6 Harness Installation
Figure 402/73-21-06-990-802-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



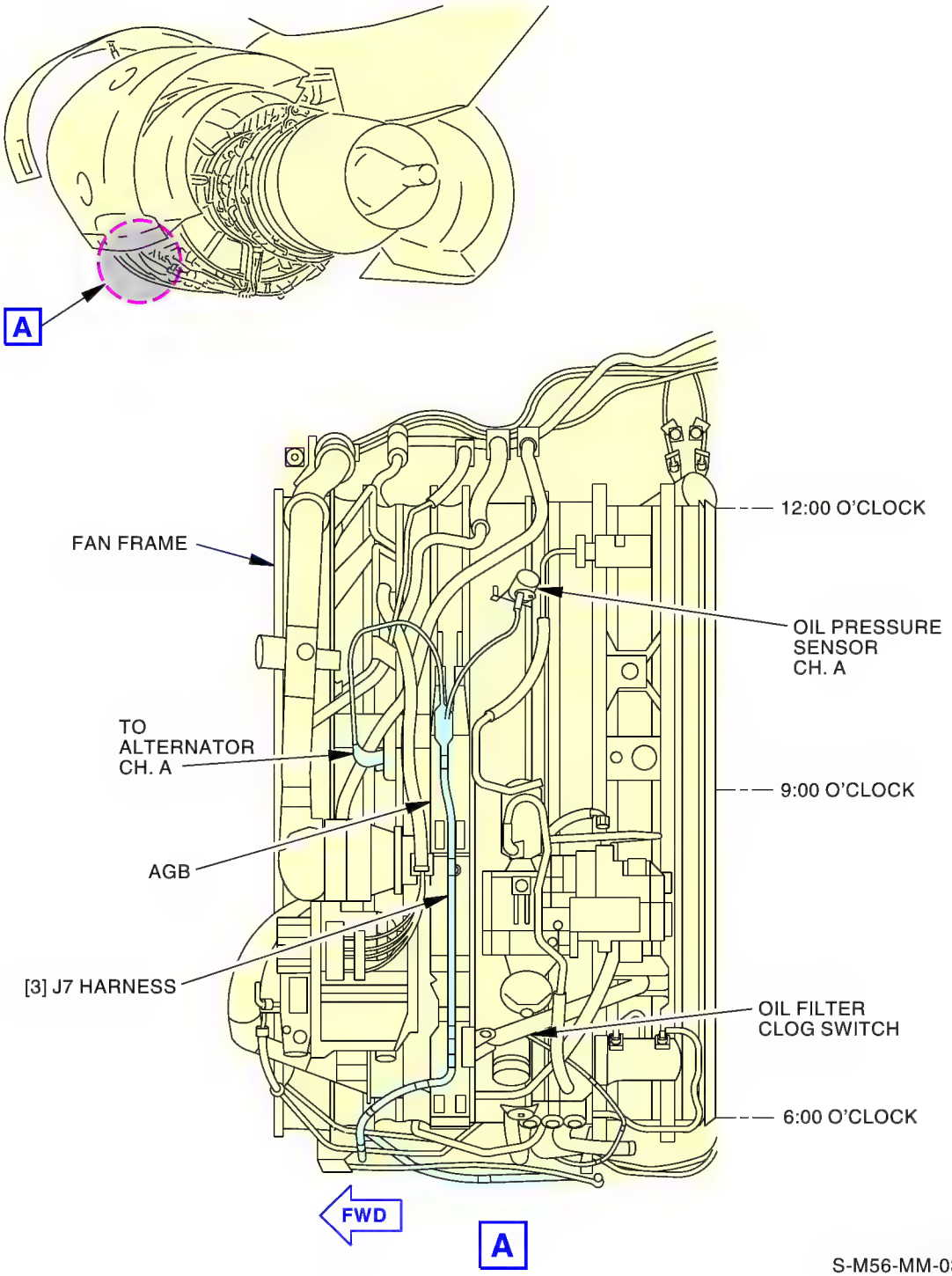
J6 Harness Installation
Figure 402/73-21-06-990-802-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



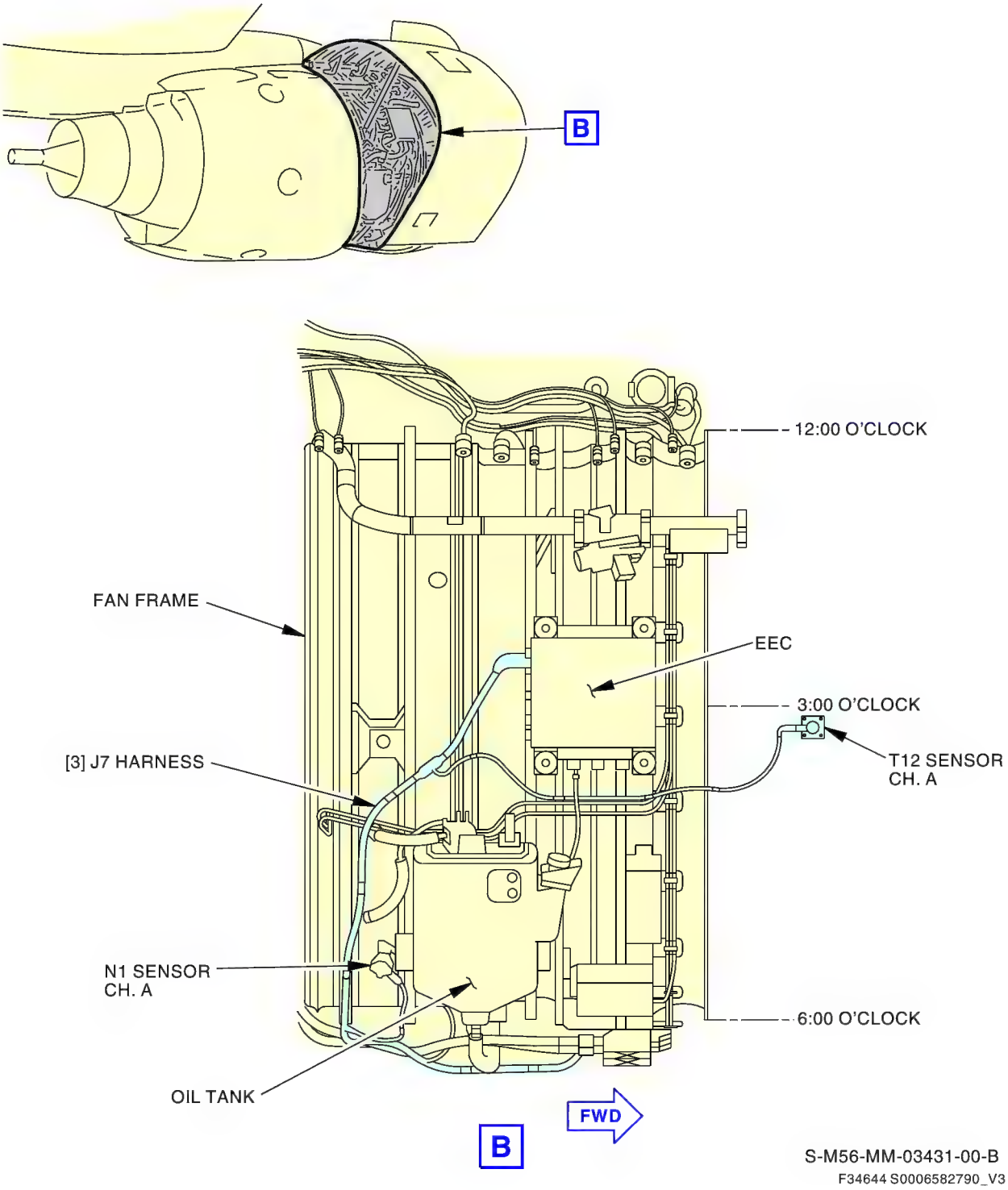
J6 Harness Installation
Figure 402/73-21-06-990-802-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



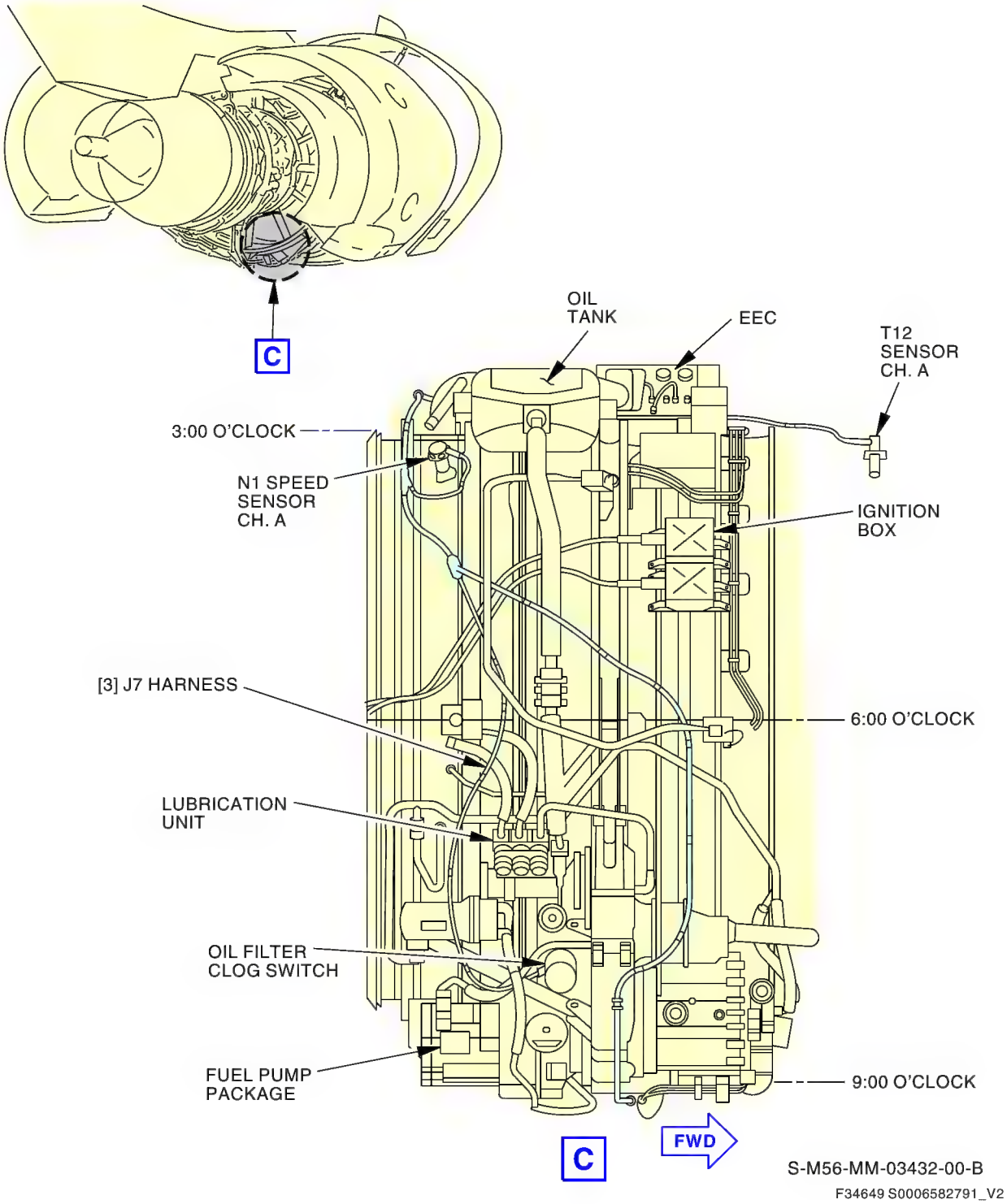
J7 Harness Installation
Figure 403/73-21-06-990-803-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



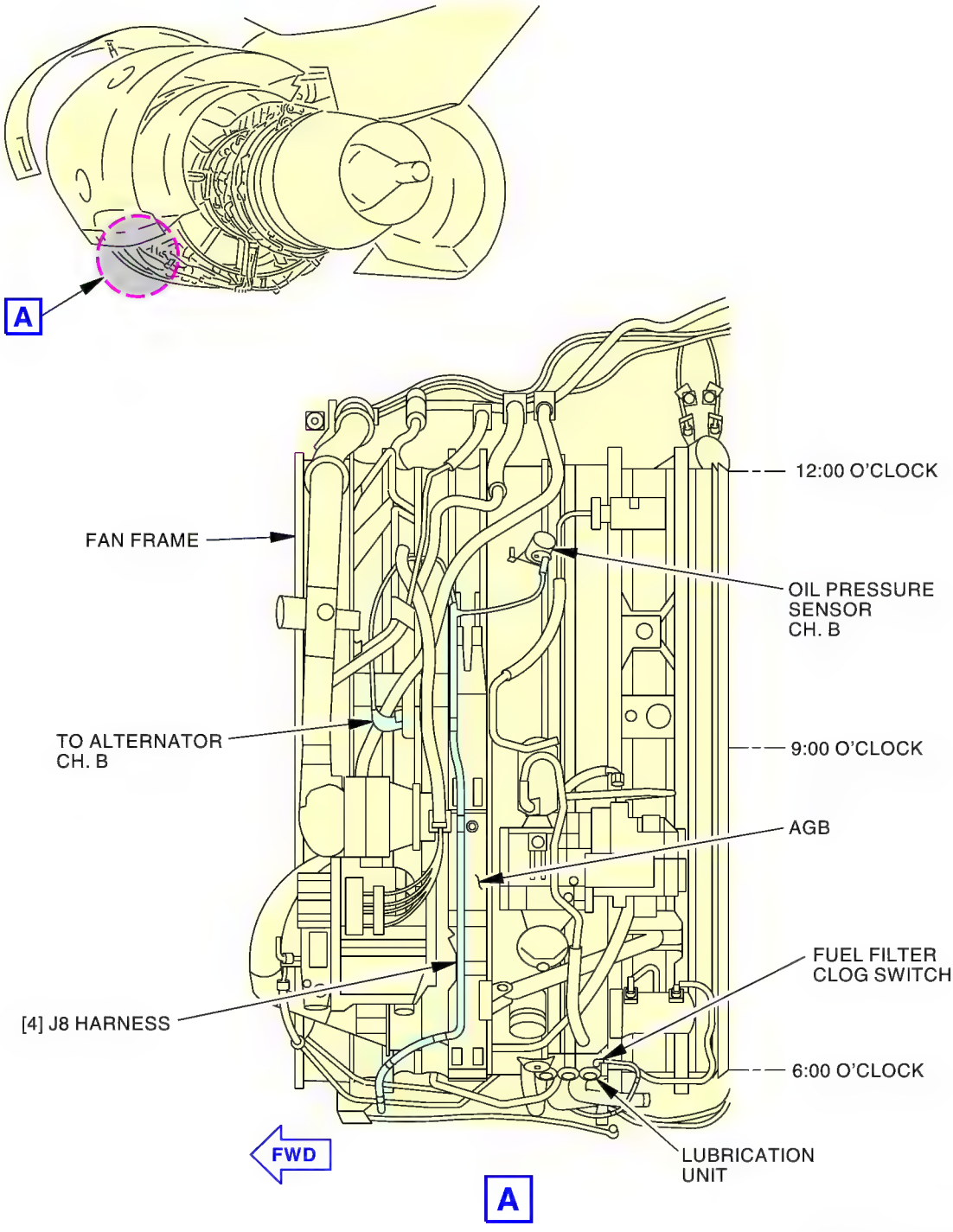
J7 Harness Installation
Figure 403/73-21-06-990-803-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



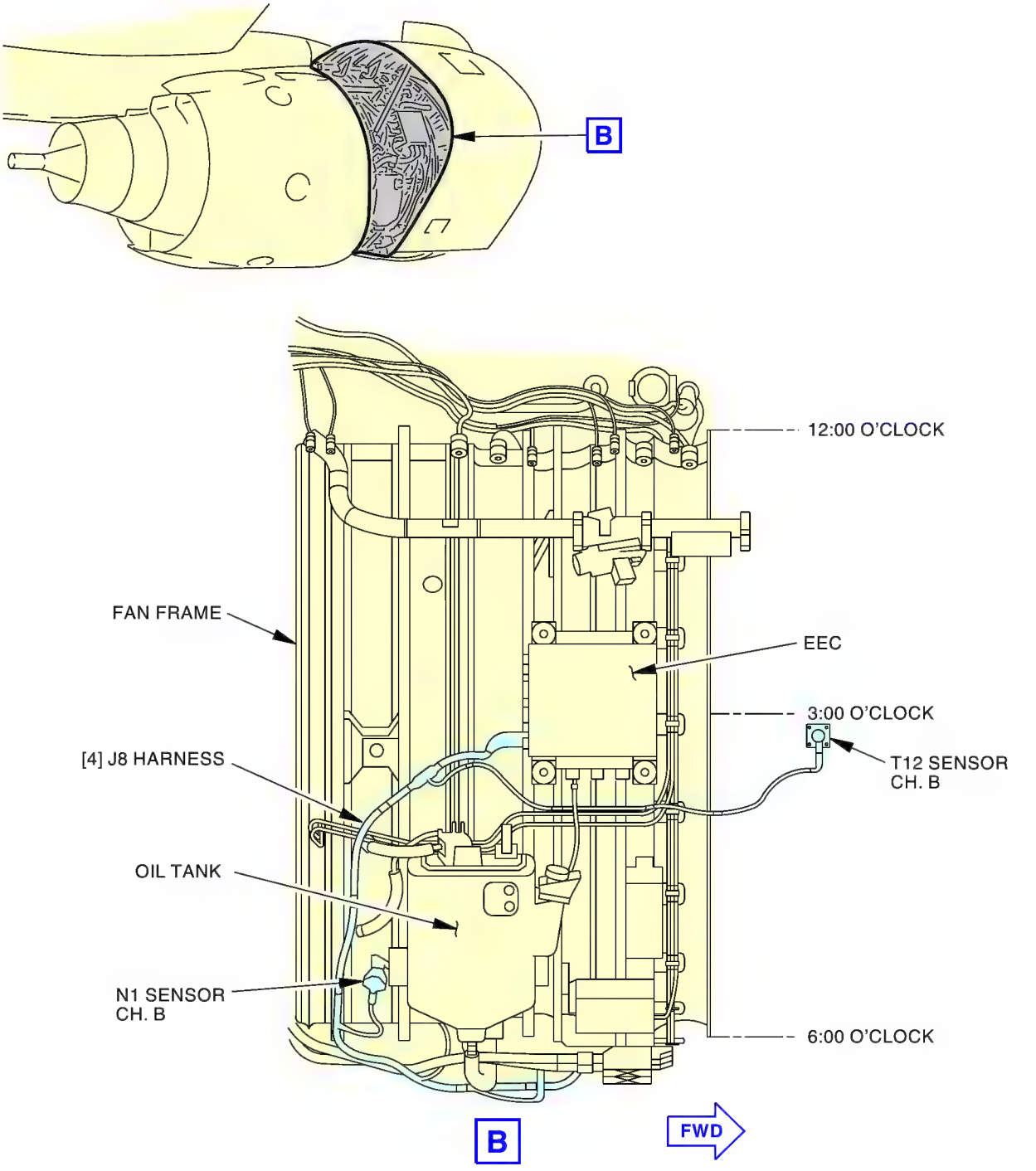
J7 Harness Installation
Figure 403/73-21-06-990-803-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



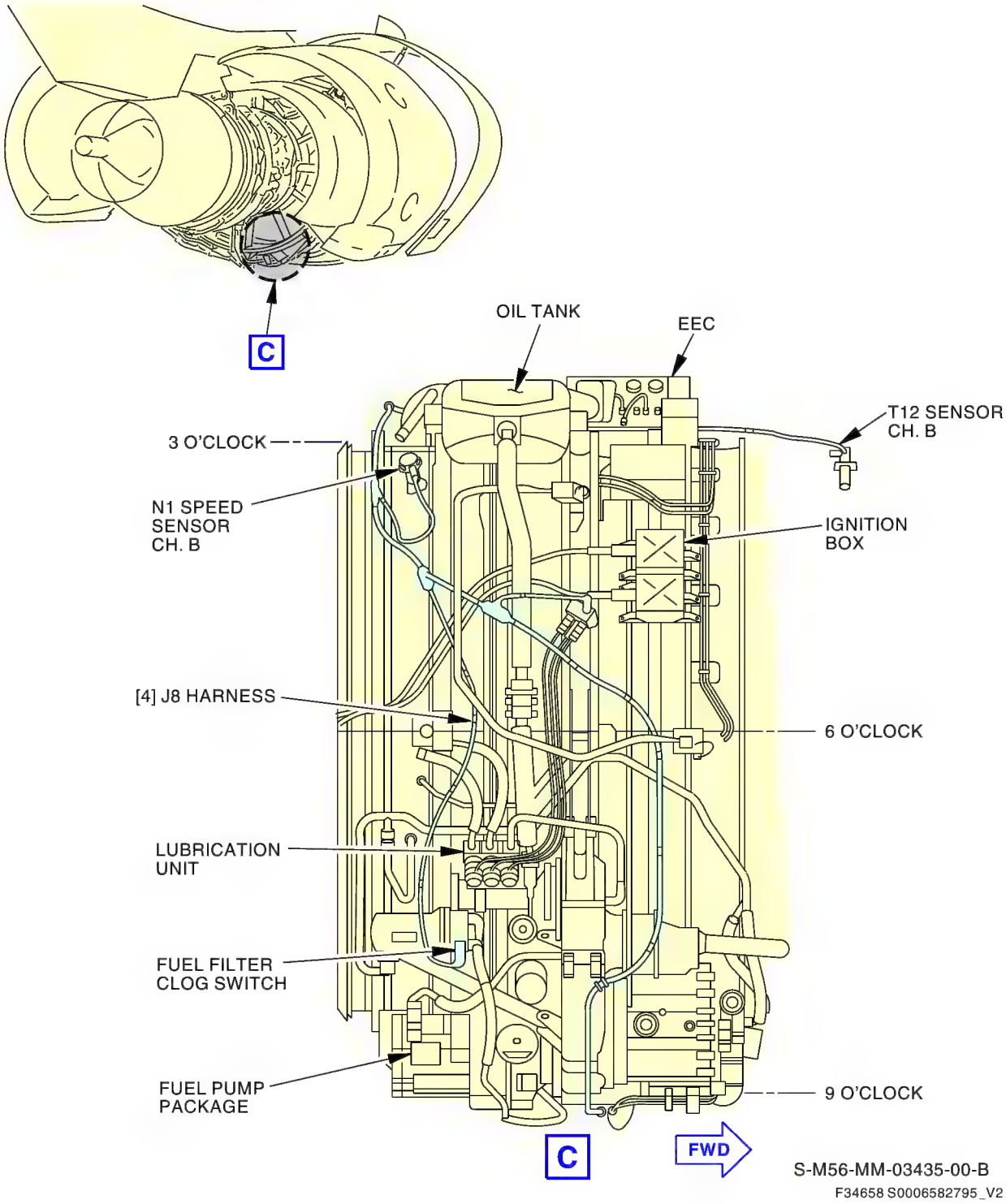
J8 Harness Installation
Figure 404/73-21-06-990-804-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



J8 Harness Installation
Figure 404/73-21-06-990-804-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



J8 Harness Installation
Figure 404/73-21-06-990-804-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-06-400-801-F00

3. Fan Wiring Harness Installation

(Figure 401, Figure 402, Figure 403, Figure 404)

A. References

Reference	Title
71-00-00-700-807-F00	Test 12 - Actuators Test (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Harness	73-21-06-01-075	IDC 001-006
		73-21-06-01A-095	IDC 007-010, 012-999
2	Harness	73-21-06-01-060	IDC 001-006
		73-21-06-01A-090	IDC 007-010, 012-999
3	Harness	73-21-06-01-085	IDC 001-006
		73-21-06-01A-115	IDC 007-010, 012-999
4	Harness	73-21-06-01-105	IDC 001-006
		73-21-06-01A-130	IDC 007-010, 012-999
		79-21-00-05-095	IDC 001-006
		79-21-00-05A-090	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Fan Wiring Harnesses Installation

SUBTASK 73-21-06-420-001-F00

(1) Do these steps to install the J5 harness [1] (Refer to Figure 401):

(a) Put the J5 harness [1] in its position on the engine.

(b) Connect the J5 electrical connectors to their receptacles:

1) EEC, J5 - DP0505

2) HMU Ch A, DP0501

3) Fuel Flow Transmitter, DP0502

4) N2 sensor Ch A, DP0503.

(c) Distribute the slack of the harness along the length of the run.

NOTE: This will make sure that the harness is not damaged by stress.

(d) Do these steps to connect the wire harness to the fan case:

1) Put the harness in the 1/4-turn hinged clamps.

a) Tighten the 1/4-turn connectors.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the bolts.

3) Use the bolts, washers, nuts, and clamps to connect the harness to the fan case.

a) Tighten the bolts with captive nuts to 72-88 inch-pounds (8.1-9.9 newton-meters).

b) Tighten the bolts with nuts to 50-80 inch-pounds (5.6-9 newton-meters).

SUBTASK 73-21-06-420-002-F00

(2) Do these steps to install the J6 harness [2] (Refer to Figure 402):

(a) Put the J6 harness [2] in its position on the engine.

(b) Connect the J6 electrical connectors to their receptacles:

1) EEC, J6 - DP0606

2) HMU Ch B, DP0601

3) Oil temperature sensor, DP0602

4) N2 sensor Ch B, DP0603.

(c) Distribute the slack of the harness along the length of the run.

NOTE: This will make sure that the harness is not damaged by stress.

(d) Do these steps to connect the wire harness to the fan case:

1) Put the harness in the 1/4-turn hinged clamps.

a) Tighten the 1/4-turn connectors.

2) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the bolts.

3) Use the bolts, washers, nuts, and clamps to connect the harness to the fan case.

a) Tighten the bolts with captive nuts to 72-88 inch-pounds (8.1-9.9 newton-meters).

b) Tighten the bolts with nuts to 50-80 inch-pounds (5.6-9 newton-meters).

SUBTASK 73-21-06-420-003-F00

(3) Do these steps to install the J7 harness [3] (Refer to Figure 403):

(a) Put the J7 harness [3] in its position on the engine.

(b) Connect the J7 electrical connectors to their receptacles:

1) EEC, J7 - DP0707

2) N1 sensor Ch A, DP0701

3) Alternator Ch A, DP0702

4) Oil filter bypass warning, DP0703

5) T12 sensor Ch A, DP0704

6) Oil pressure sensor Ch A, DP0705.

(c) Distribute the slack of the harness along the length of the run.

NOTE: This will make sure that the harness is not damaged by stress.

(d) Do these steps to connect the wire harness to the fan case:

1) Put the harness in the 1/4-turn hinged clamps.

a) Tighten the 1/4-turn connectors.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the bolts.

3) Use the bolts, washers, nuts, and clamps to connect the harness to the fan case.

a) Tighten the bolts with captive nuts to 72-88 inch-pounds (8.1-9.9 newton-meters).

b) Tighten the bolts with nuts to 50-80 inch-pounds (5.6-9 newton-meters).

SUBTASK 73-21-06-020-005-F00

(4) Do these steps to install the J8 harness [4] (Refer to Figure 404):

(a) Put the J8 harness [4] in its position on the engine.

(b) Connect the J8 electrical connectors to their receptacles:

1) EEC, J8 - DP0808

2) N1 sensor Ch B, DP0801

3) Alternator Ch B, DP0802

4) Fuel filter bypass warning, DP0803

5) T12 sensor Ch B, DP0804

6) Oil pressure sensor Ch B, DP0805

7) DPM box, DP0806.

(c) Distribute the slack of the harness along the length of the run.

NOTE: This will make sure that the harness is not damaged by stress.

(d) Do these steps to connect the wire harness to the fan case:

1) Put the harness in the 1/4-turn hinged clamps.

a) Tighten the 1/4-turn connectors to 62-71 inch-pounds (7-8 newton-meters).

2) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the bolts.

3) Use the bolts, washers, nuts, and clamps to connect the harness to the fan case.

a) Tighten the bolts with captive nuts to 72-88 inch-pounds (8.1-9.9 newton-meters).

b) Tighten the bolts with nuts to 50-80 inch-pounds (5.6-9 newton-meters).

F. Put the Airplane in a Serviceable Condition

SUBTASK 73-21-06-840-002-F00

(1) Do these steps to put the airplane in a serviceable condition:

(a) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do these tasks after the installation of the J5, J6, J7 and J8 harnesses.

1) Do this test: EEC TEST, TASK 73-21-00-700-804-F00.

2) Do this test: Test 12 - Actuators Test, TASK 71-00-00-700-807-F00.

(d) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

——— END OF TASK ———

TASK 73-21-06-000-802-F00

4. 3 O'clock Strut Harness Removal

(Figure 405).

A. General

(1) The 3 o'clock strut harnesses are the J9 harness [5], J10 harness [6], and the MW0311 harness [7].

B. References

Reference	Title
72-23-03-000-802-F00	Shroud Segments Removal (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-21-06-840-003-F00

(1) Do these steps:

(a) For engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
A	6	C00148	ANTI-ICE & RAIN ENG 1 & WING CONT

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES L

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) For engine 2, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
B	6	C00149	ANTI-ICE & RAIN ENGINE 2 CONTROL

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES R

WARNING DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION OF THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

(d) Do this step for the removal of the J9 harness [5] or J10 harness [6]:

1) Remove the lower-left inner panel of the thrust reverser extension ring (TASK 72-23-03-000-802-F00).

(e) Do these steps to remove the 3:00 o'clock strut fairing [10] from the 3:00 o'clock strut (Figure 405):

1) Remove the screws [11] that hold the 3:00 o'clock strut fairing [10] to the 3:00 o'clock strut.
2) Remove the 3:00 o'clock strut fairing [10].
3) Remove the bolts [19] and washers [13] that hold the 3:00 o'clock strut seal [14].
   a) Remove the 3:00 o'clock strut seal [14].
4) Remove the bolts [15] that hold the upper half-firewall [16] to the lower half-firewall [17].
   a) Remove the upper half-firewall [16].
5) Remove the metal plug [18] from the upper half-firewall [16].
6) Remove the bolts [12] that hold the lower half-firewall [17] to the 3:00 o'clock strut.
   a) Remove the lower half-firewall [17].

E. 3 O'clock Strut Harness Removal

SUBTASK 73-21-06-020-006-F00

(1) Do these steps to remove the J9 harness [5] (Figure 405, Figure 406):

NOTE: The tasks for the removal of the J9 harness [5], J10 harness [6], and the MW0311 harness [7] can be completed at the same time.

(a) Disconnect these J9 electrical connectors from the receptacles:

1) EEC, J9 - DP0909

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) VSV position transducer Ch A, DP0902
3) HPTACC valve position transducer Ch A, DP0903
4) LPTACC valve position transducer Ch A, DP0904
5) T3 probe Ch A, DP0905

IDC ALL PRE SB CFM56-7B 73-44 OR PRE SB 737-CFM56-7B-73-058

6) BSV switch Ch A, DP0906

IDC ALL POST SB 737-CFM56-7B-73-058 OR POST SB CFM56-7B 73-44

7) If it is installed, disconnect DP1006 from bracket, if it is not installed, disregard this step.

IDC ALL

8) TBV position transducer Ch A, DP0907
9) VBV position transducer Ch A, DP0908
10) T25 sensor Ch A, DP0910
11) CJ9 receptacle, DP0901.

(b) Do these steps to disconnect the J9 harness [5] (Figure 405):

1) Disconnect the MW0311 harness [7] from the omega clamps [22] on the J9 harness box [23].
2) Remove the bolt [20] and bolt [21] that hold the J9 harness box [23] and J10 harness box [24] to the bracket on the 3:00 o'clock strut wall.
3) Open the 1/4-turn hinged clamps that hold the J9 harness [5] to the engine.
4) Pull the flexible clamp, with the harnesses, from the 3:00 o'clock strut and disconnect the J9 harness [5].
   a) Carefully move the J9 harness [5] through the 3:00 o'clock strut, towards the center of the engine.

(c) Remove the J9 harness [5].

SUBTASK 73-21-06-020-007-F00

(2) Do these steps to remove the J10 harness [6] (Figure 405, Figure 407):

NOTE: The tasks for the removal of the J9 harness [5], J10 harness [6], and the MW0311 harness [7] can be completed at the same time.

(a) Disconnect these J10 electrical connectors from the receptacles:

1) EEC, J10 - DP1010
2) VSV position transducer Ch B, DP1002
3) HPTACC valve position transducer Ch B, DP1003
4) LPTACC valve position transducer Ch B, DP1004
5) T3 probe Ch B, DP1005

IDC ALL PRE SB CFM56-7B 73-44 OR PRE SB 737-CFM56-7B-73-058

6) BSV switch Ch B, DP1006

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL POST SB 737-CFM56-7B-73-058 OR POST SB CFM56-7B 73-44

7) If it is installed, disconnect DP1006 from bracket, if it is not installed, disregard this step.

IDC ALL

8) TBV position transducer Ch B, DP1007
9) VBV position transducer Ch B, DP1008
10) T25 sensor Ch B, DP1009
11) CJ10 receptacle, DP1001.

(b) Do these steps to disconnect the J10 harness [6]:

1) Remove the bolt [20] and bolt [21] that hold the J9 harness box [23] and J10 harness box [24] to the bracket on the 3:00 o'clock strut wall.
2) Open the 1/4-turn hinged clamps that hold the J10 harness [6] to the engine.
3) Pull the flexible clamp, with the harnesses, from the 3:00 o'clock strut and disconnect the J10 harness [6].
   a) Carefully move the J10 harness [6] through the 3:00 o'clock strut, towards the center of the engine.

(c) Remove the J10 harness [6].

SUBTASK 73-21-06-020-008-F00

(3) Do these steps to remove the MW0311 harness [7] (Figure 405, Figure 408):

NOTE: The tasks for the removal of the J9 harness [5], J10 harness [6], and the MW0311 harness [7] can be completed at the same time.

(a) Disconnect these MW0311 electrical connectors from the receptacles:

1) Bleed air controller, DP1102
2) Ground wing thermal anti-ice solenoid valve, DP1103
3) FFCC vibration sensor, DP1101
4) Engine disconnect panel, DP1104.

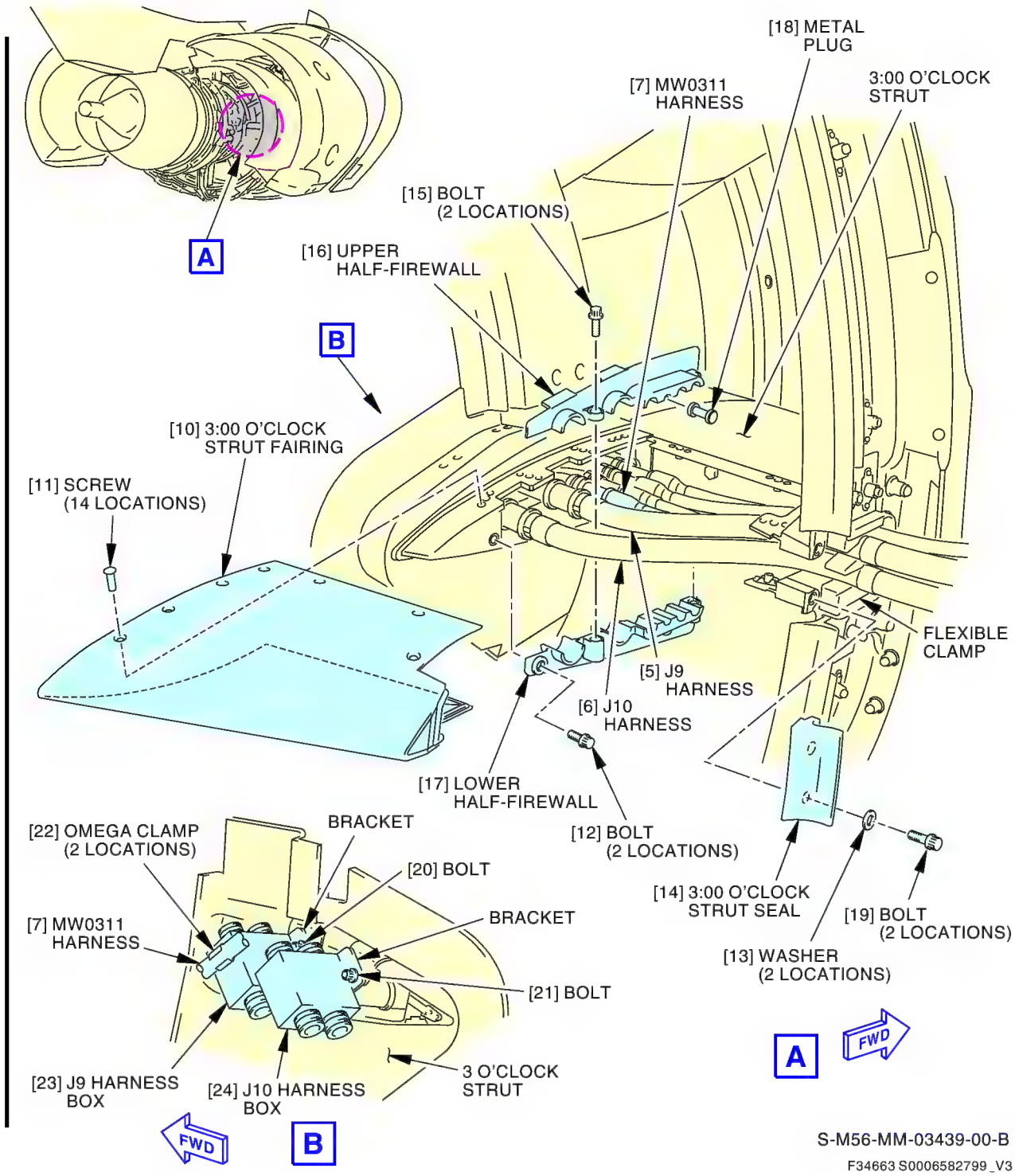
(b) Do these steps to disconnect the MW0311 harness [7]:

1) Disconnect the MW0311 harness [7] from the omega clamp [22] of the J9 harness box [23].
2) Open the 1/4-turn hinged clamps that hold the MW0311 harness [7] to the engine.
3) Pull the flexible clamp, with the harnesses, from the 3:00 o'clock strut and disconnect the MW0311 harness [7].
   a) Carefully move the MW0311 harness [7] through the 3:00 o'clock strut, towards the center of the engine.

(c) Remove the MW0311 harness [7].

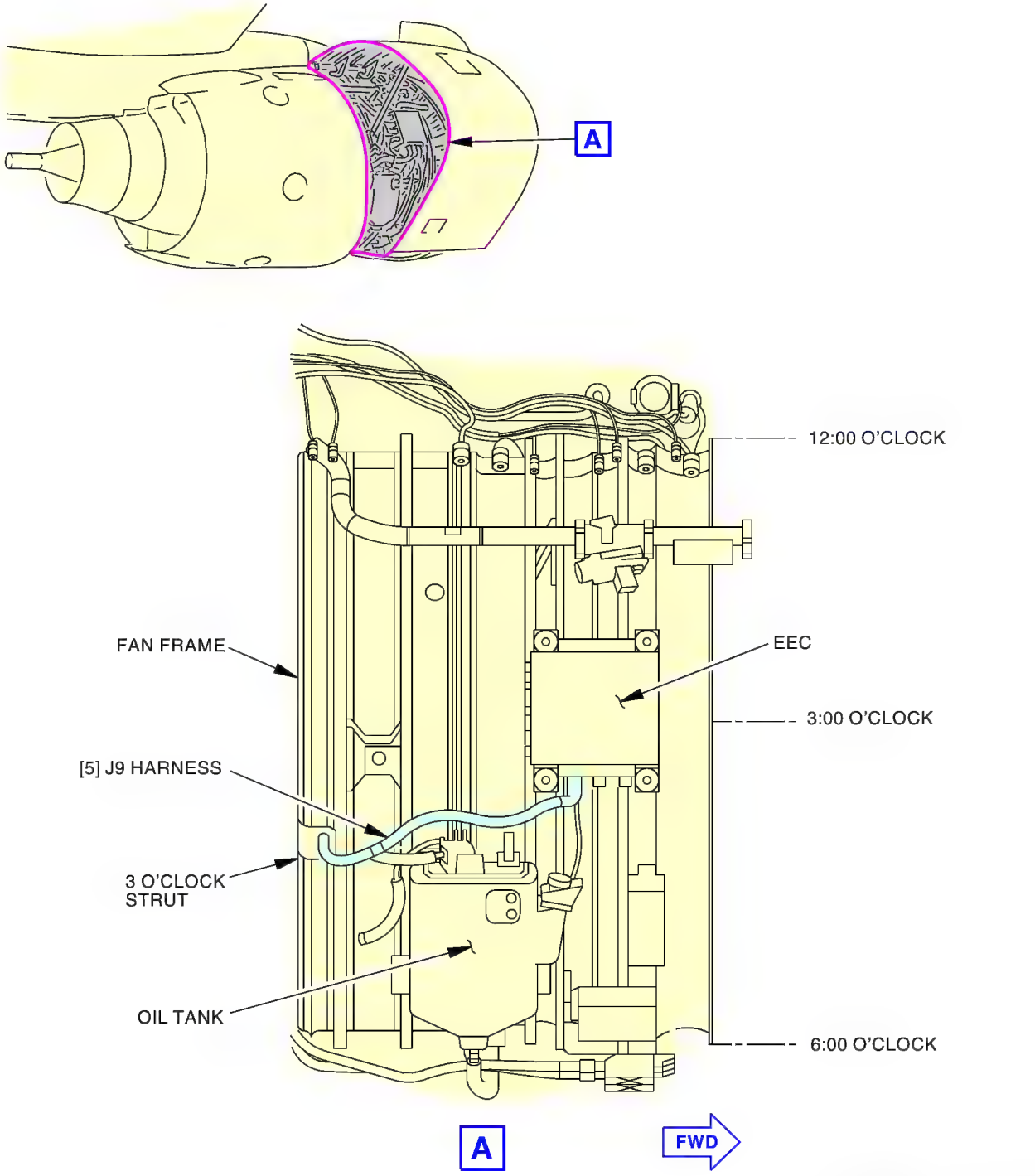
END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



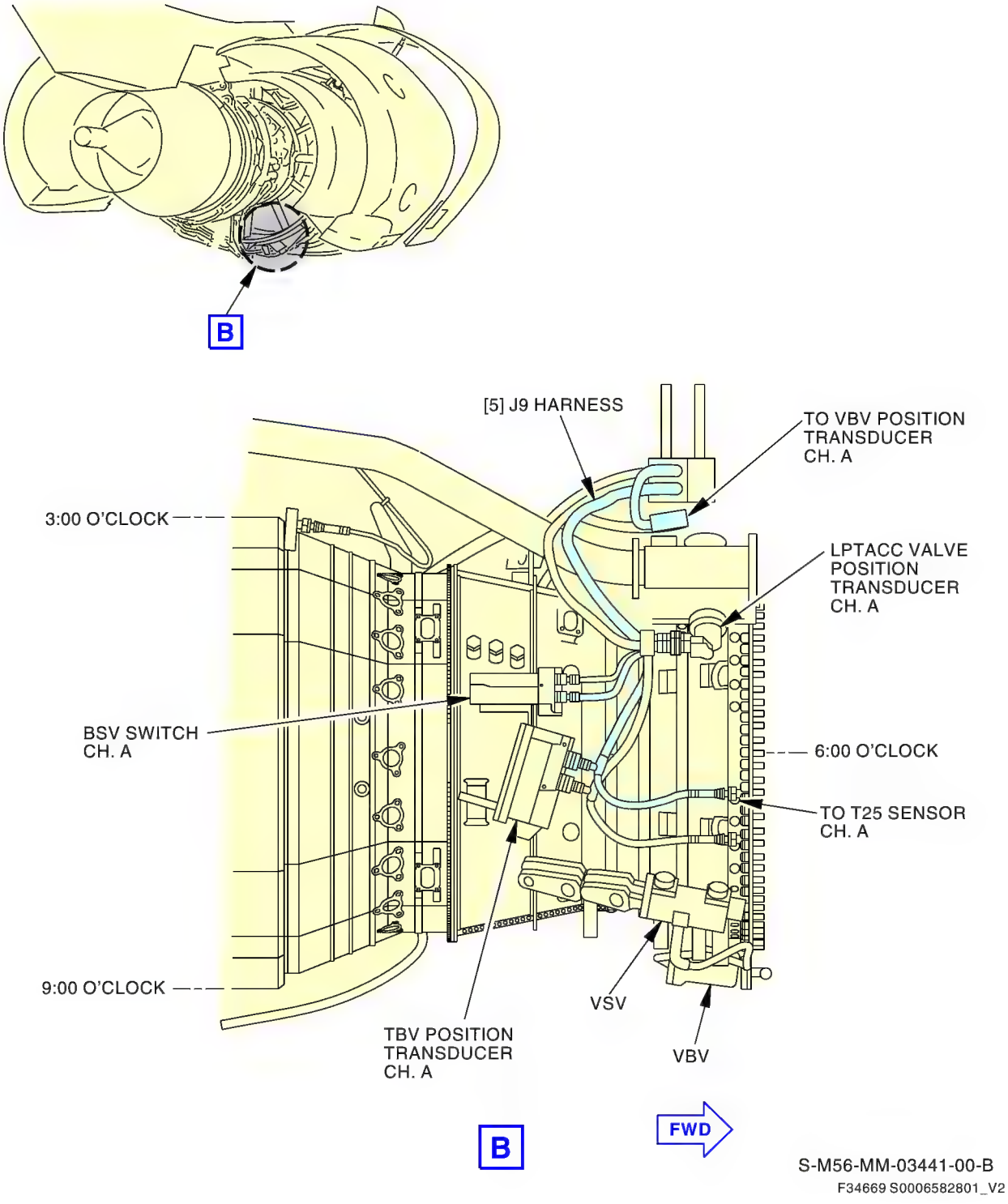
3:00 O'Clock Strut Harness Installation
Figure 405/73-21-06-990-805-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



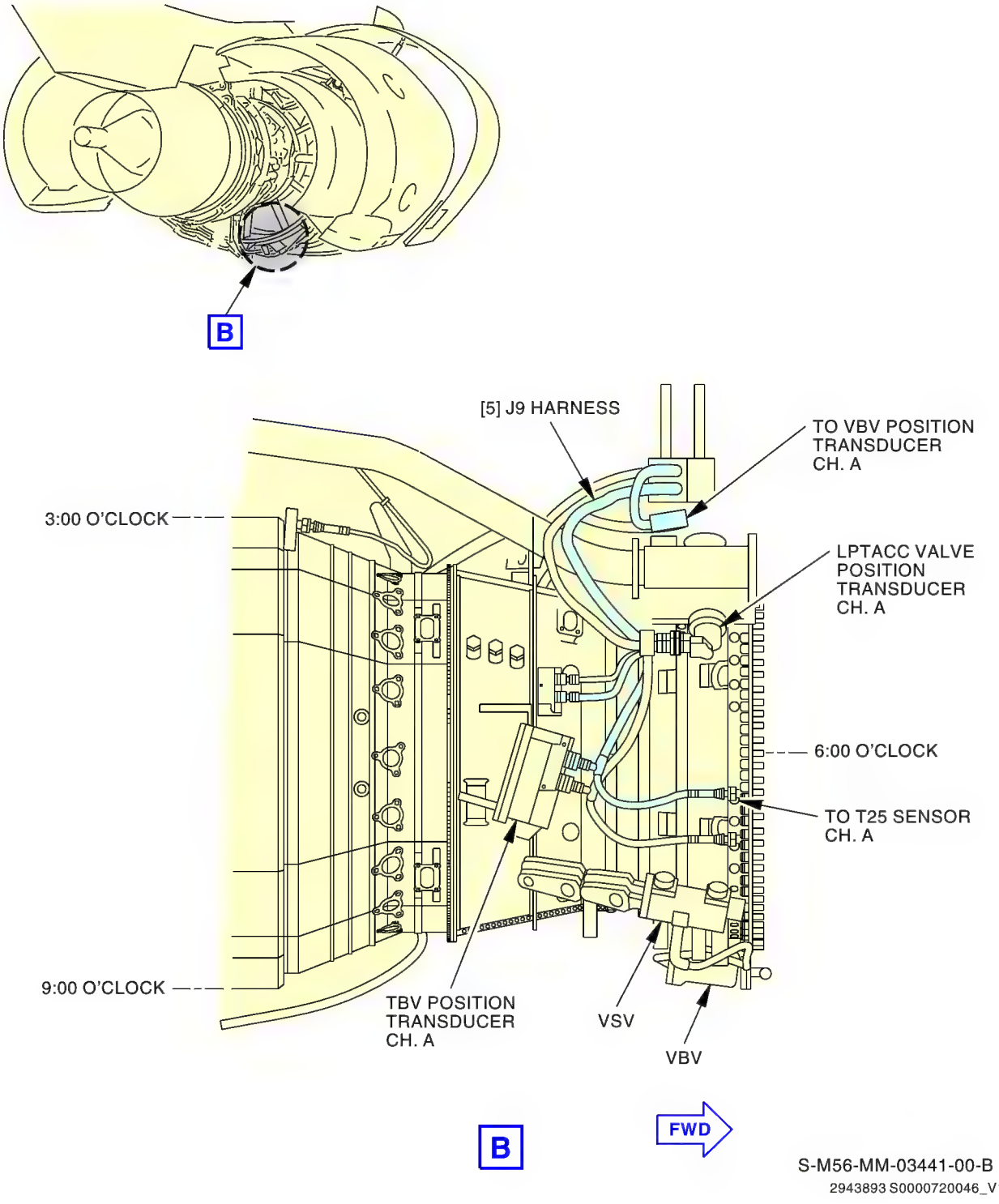
J9 Harness Installation
Figure 406/73-21-06-990-806-F00 (Sheet 1 of 4)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



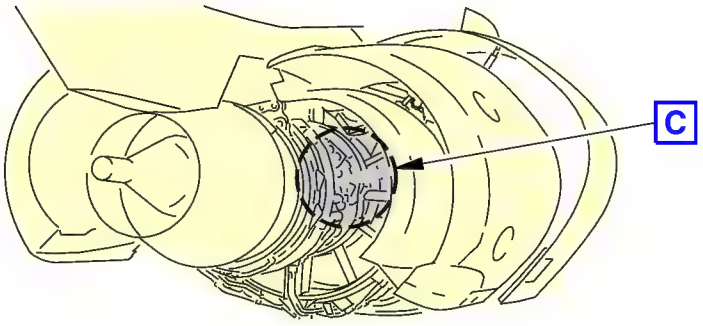
J9 Harness Installation
Figure 406/73-21-06-990-806-F00 (Sheet 2 of 4)

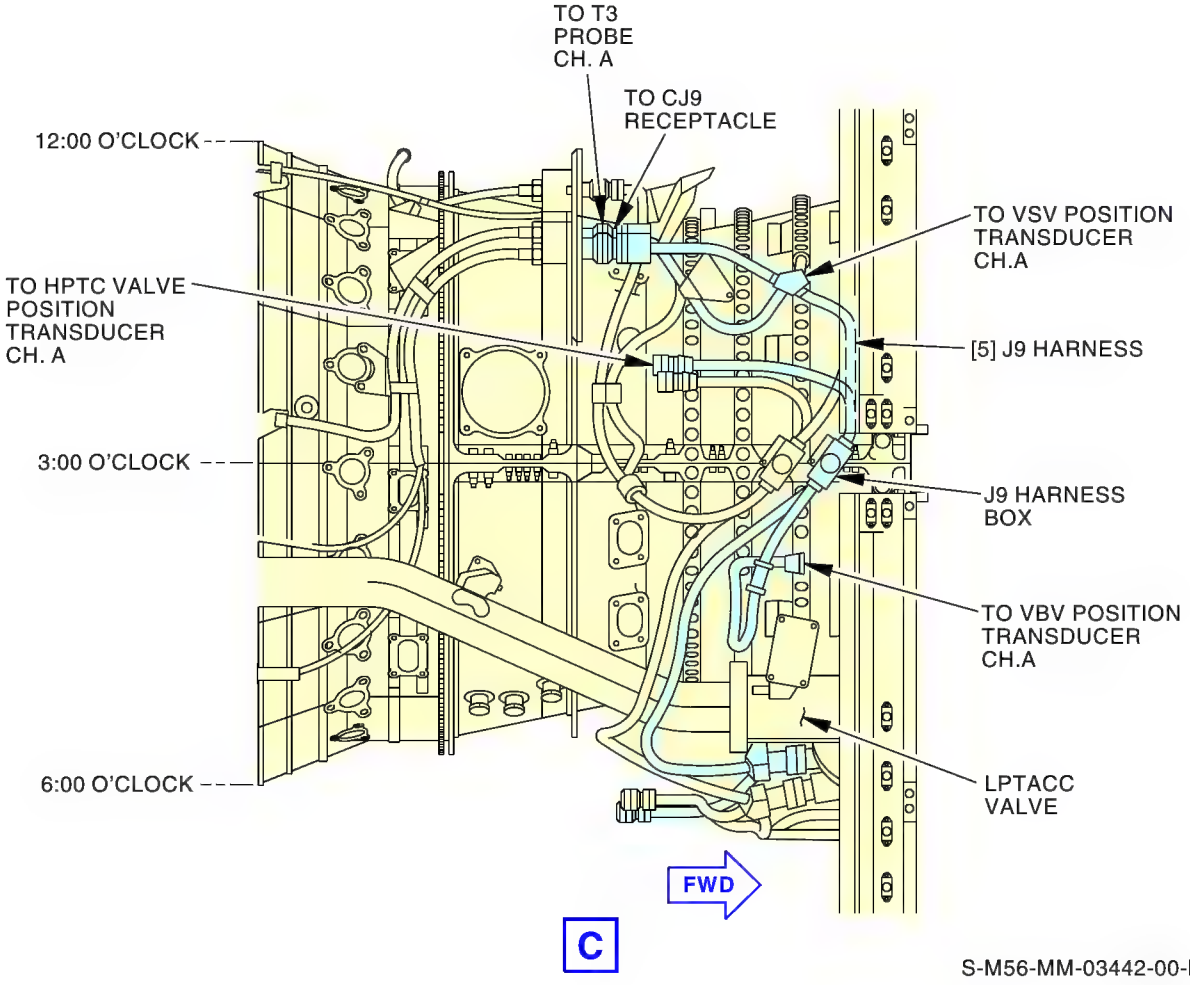
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



J9 Harness Installation
Figure 406/73-21-06-990-806-F00 (Sheet 3 of 4)

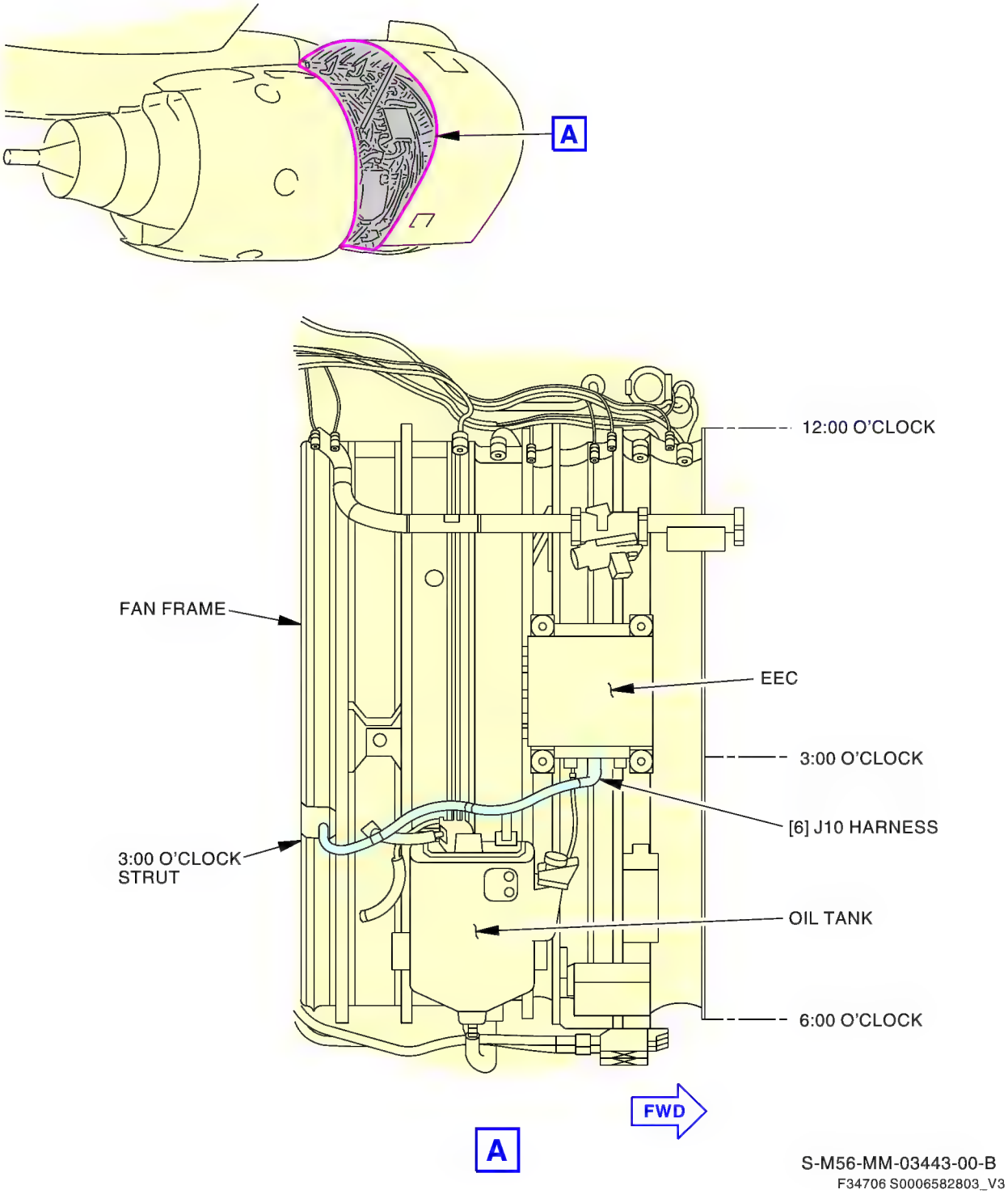
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details





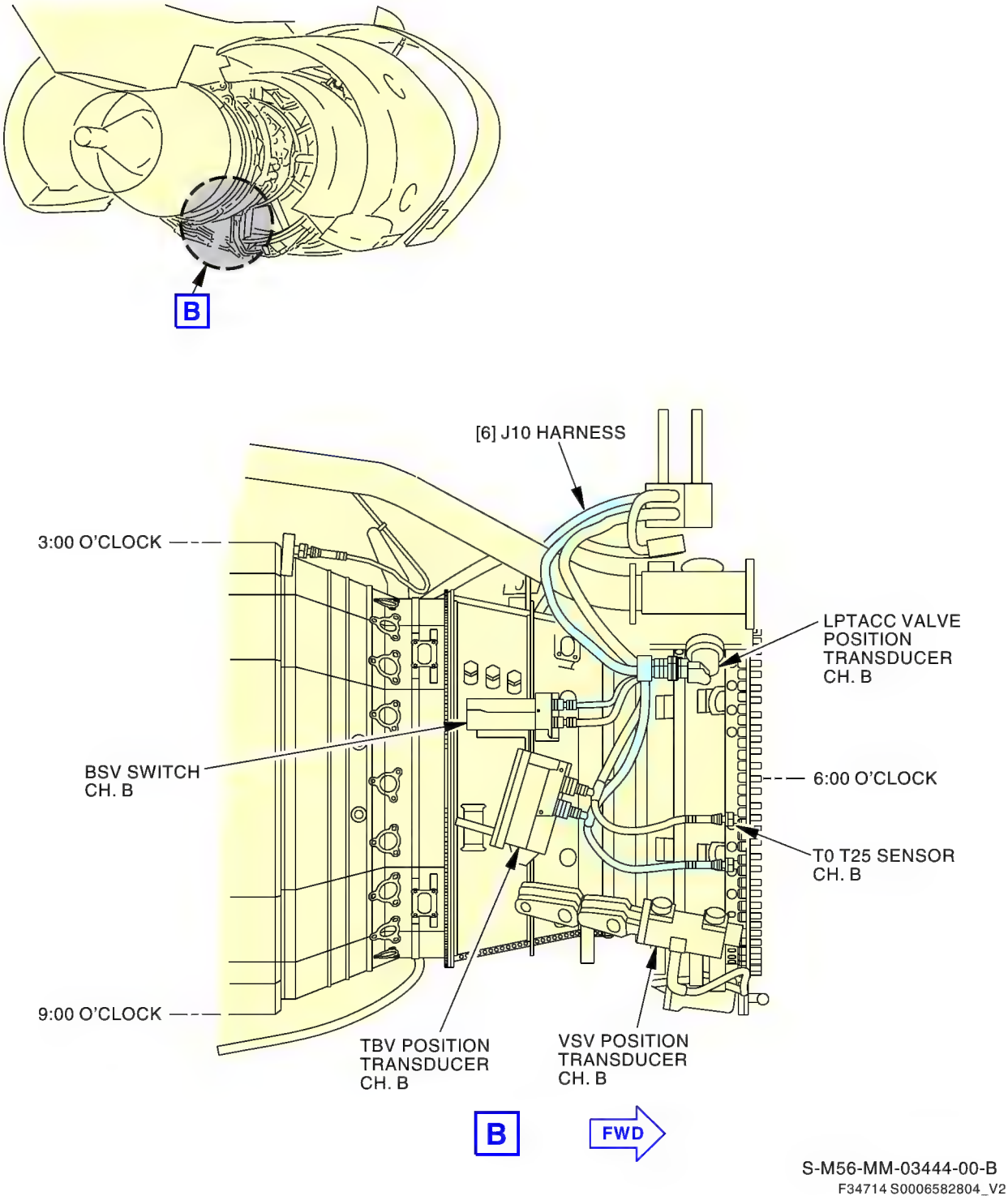
J9 Harness Installation
Figure 406/73-21-06-990-806-F00 (Sheet 4 of 4)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



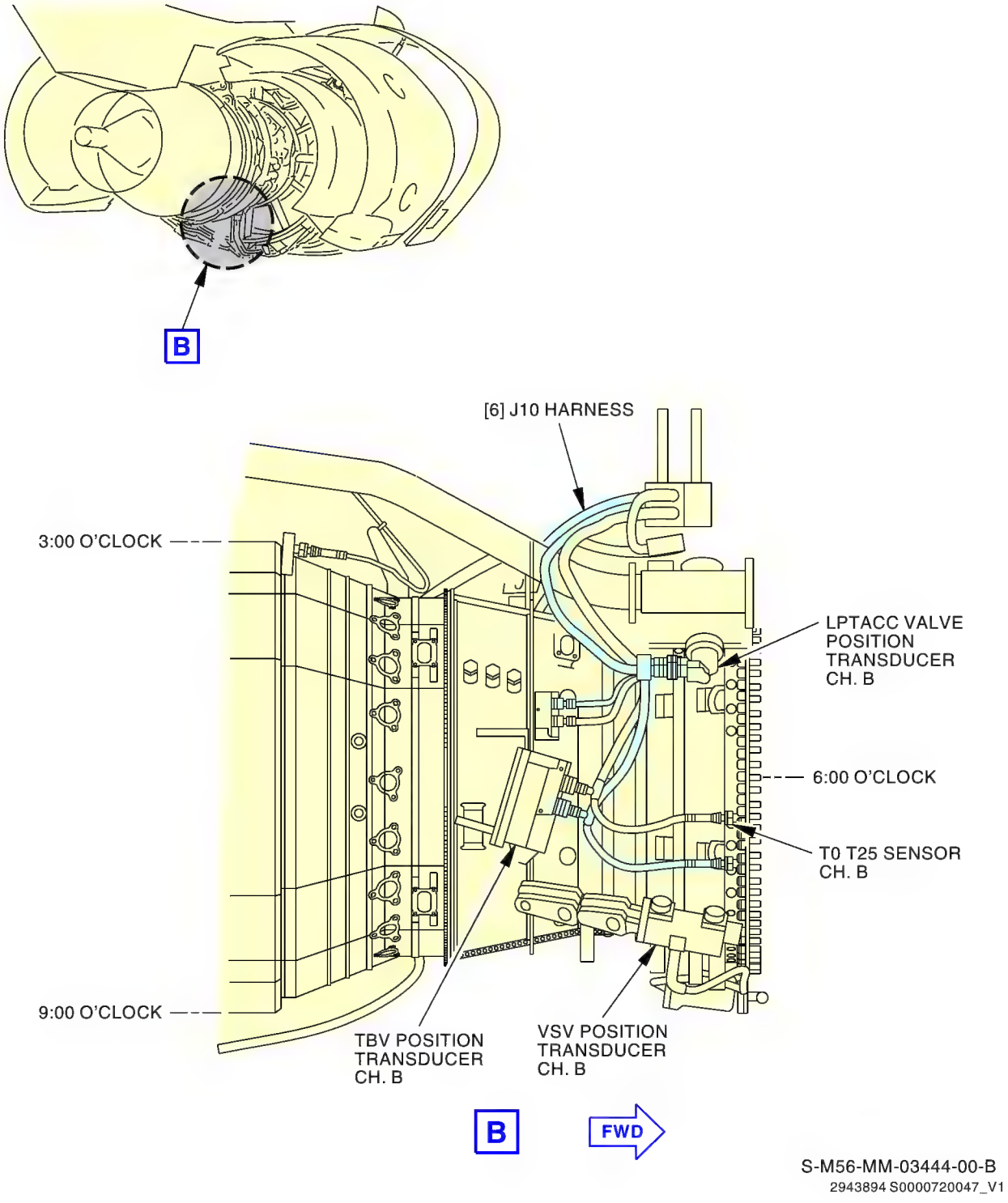
J10 Harness Installation
Figure 407/73-21-06-990-807-F00 (Sheet 1 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



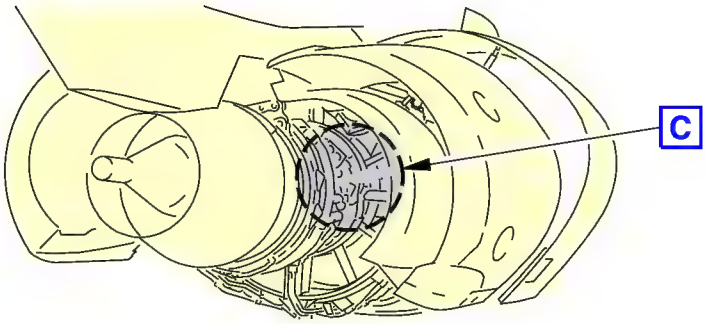
J10 Harness Installation
Figure 407/73-21-06-990-807-F00 (Sheet 2 of 5)

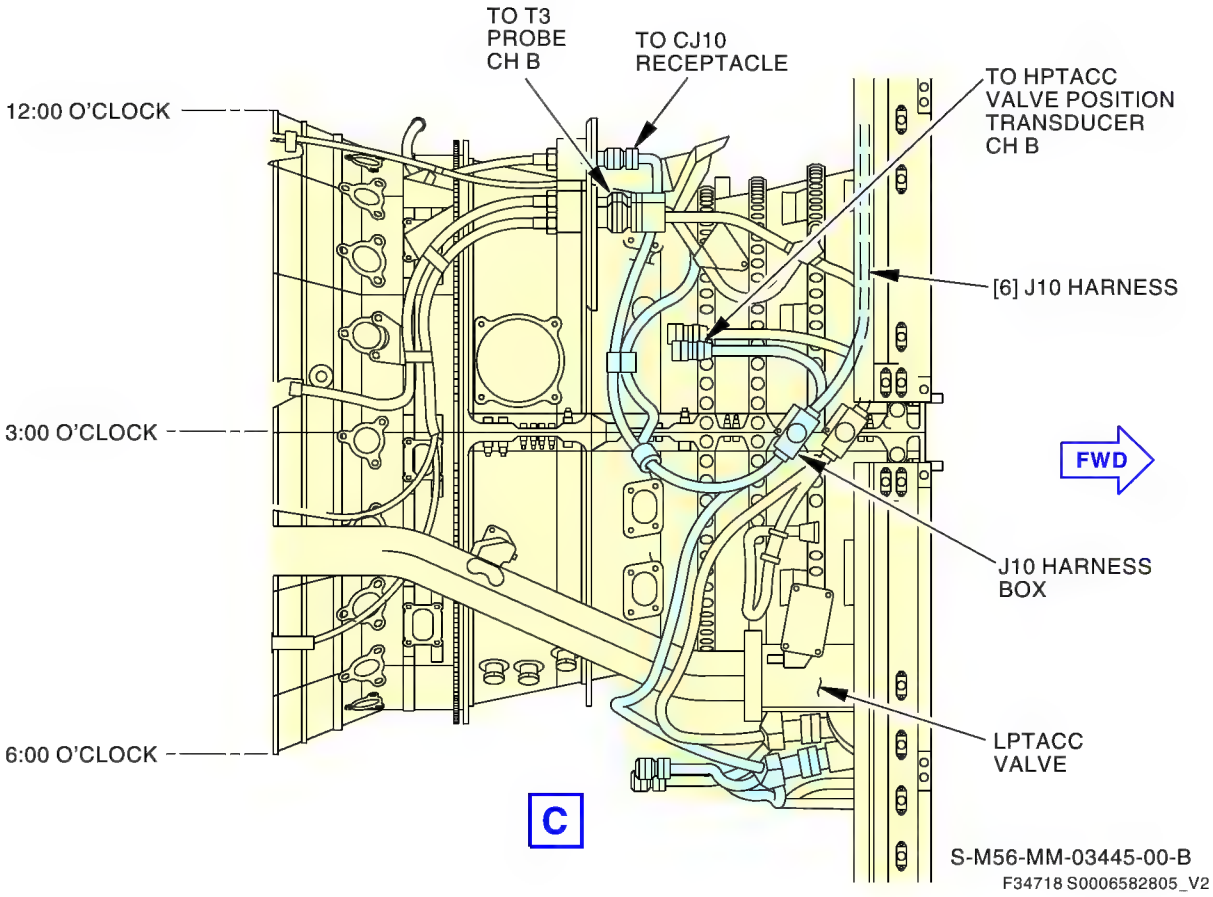
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



J10 Harness Installation
Figure 407/73-21-06-990-807-F00 (Sheet 3 of 5)

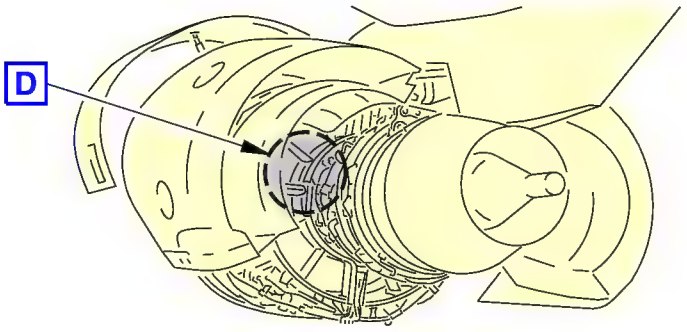
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

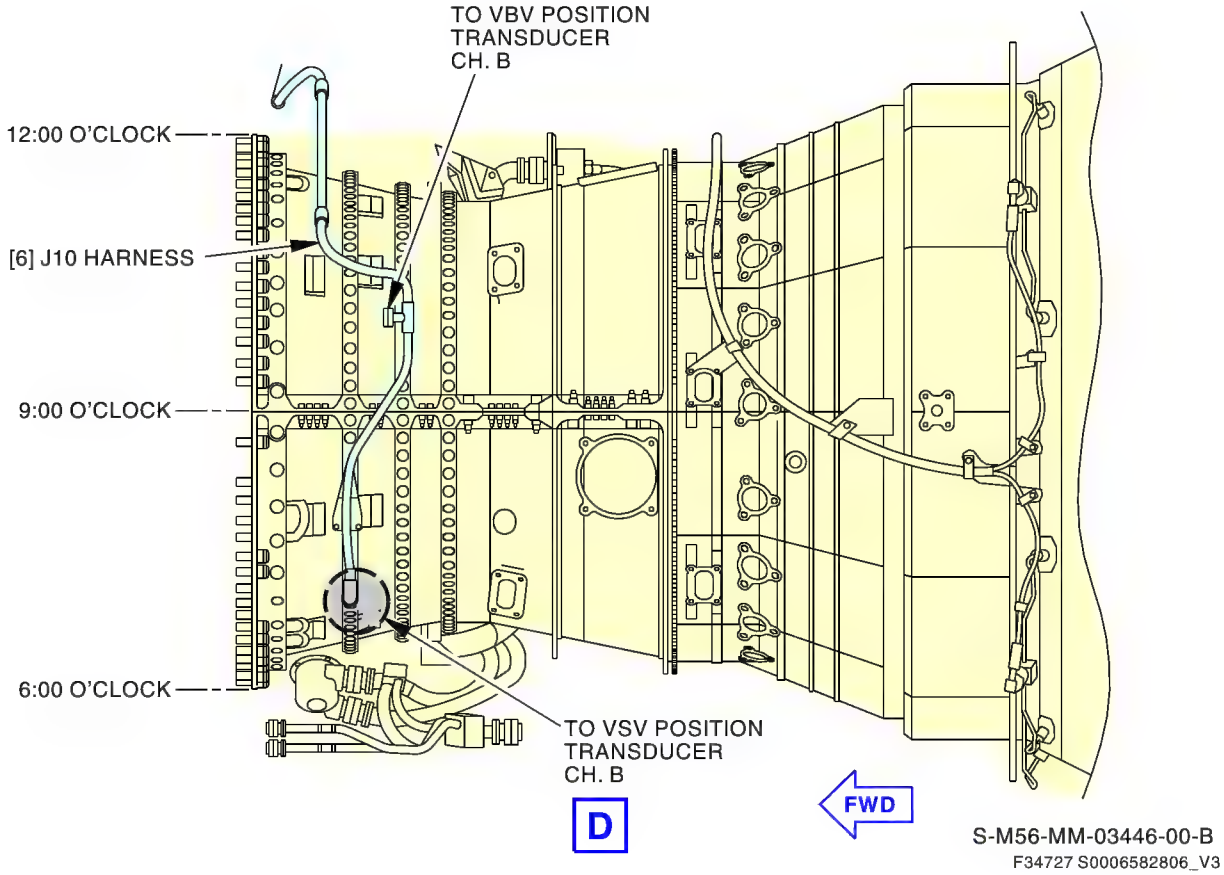




J10 Harness Installation
Figure 407/73-21-06-990-807-F00 (Sheet 4 of 5)

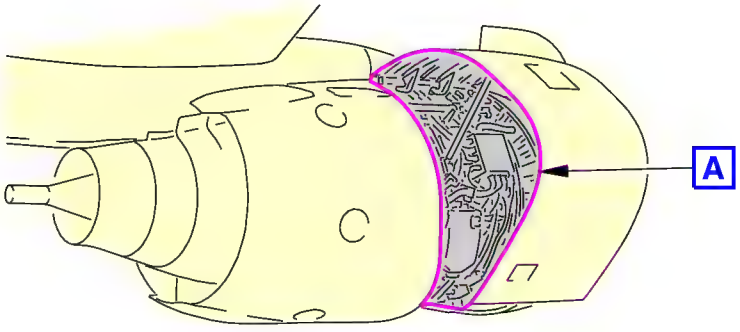
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

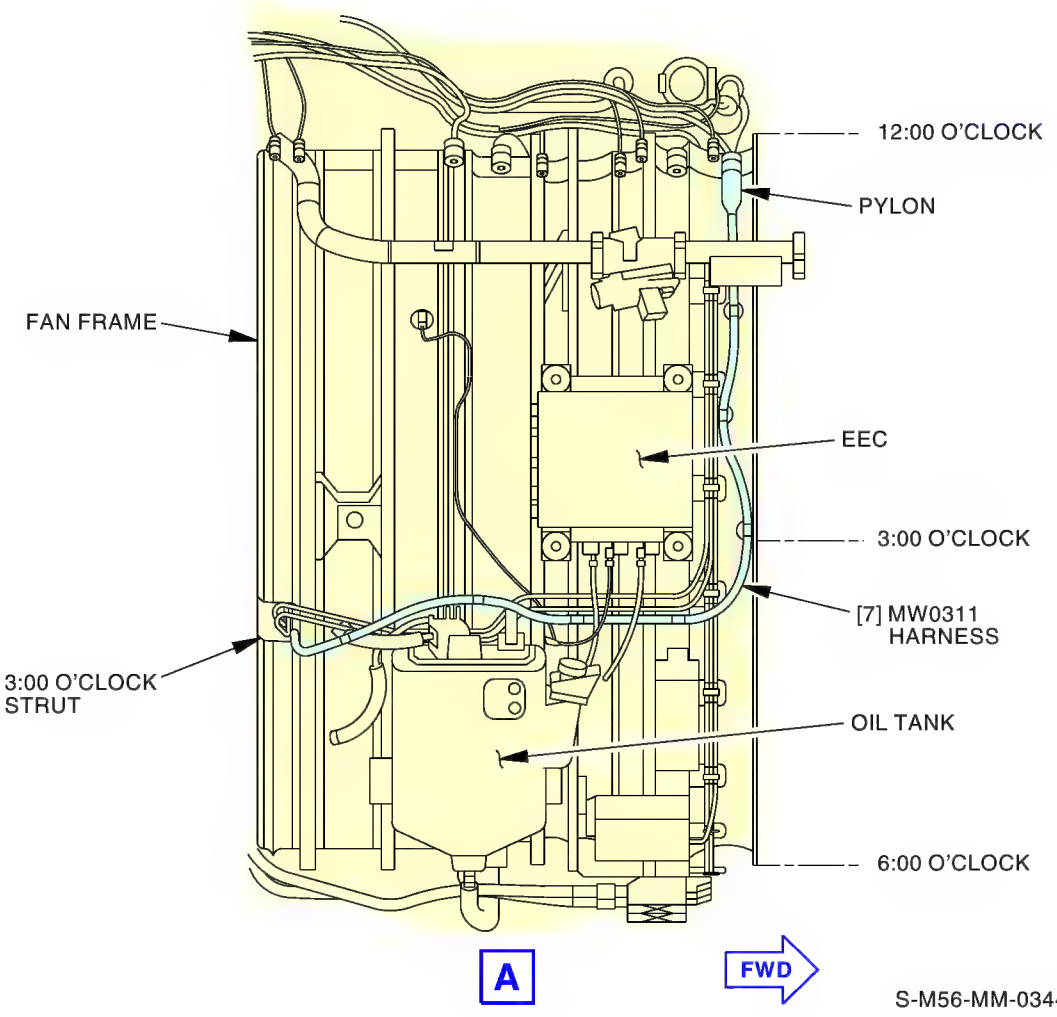




J10 Harness Installation
Figure 407/73-21-06-990-807-F00 (Sheet 5 of 5)

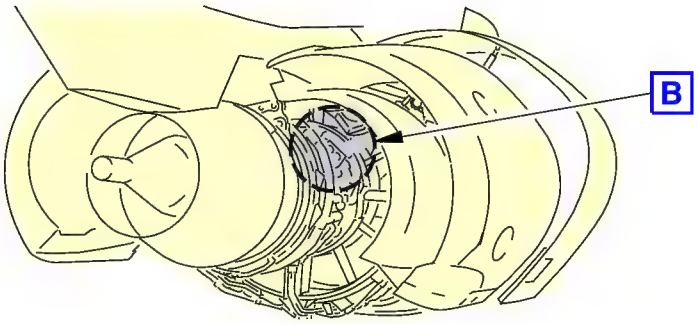
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

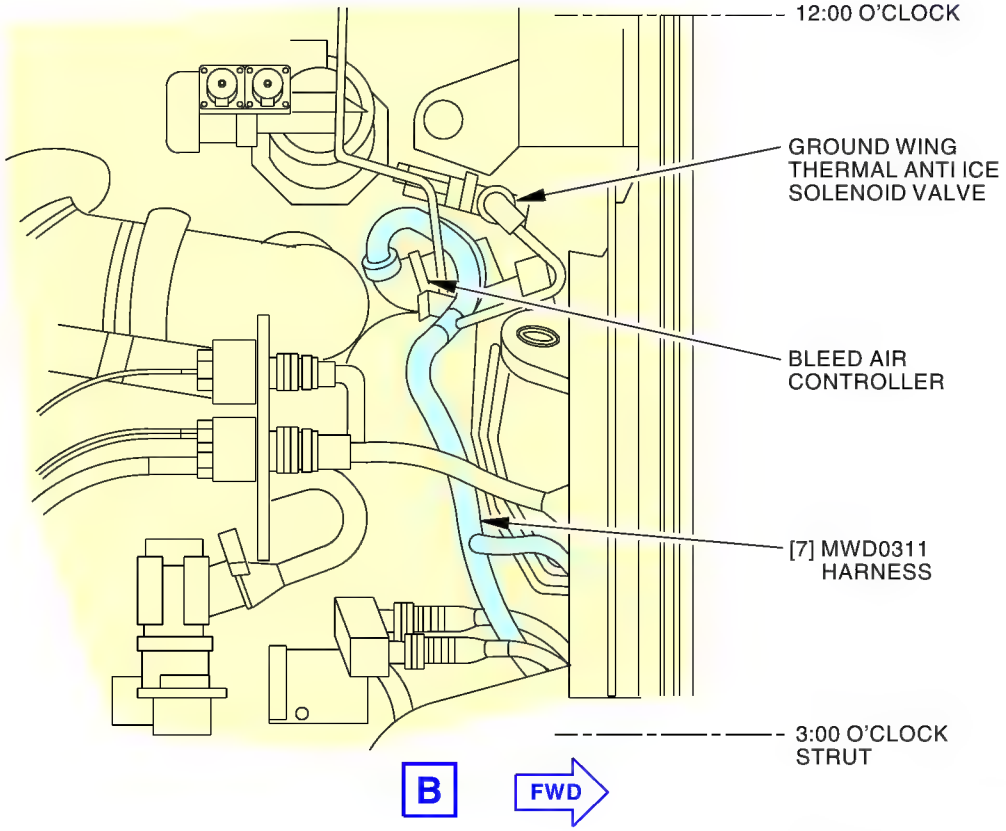




MW0311 Harness Installation
Figure 408/73-21-06-990-808-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details





MW0311 Harness Installation
Figure 408/73-21-06-990-808-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-06-400-802-F00

5. 3 O'clock Strut Harness Installation

(Figure 405).

A. References

Reference	Title
30-11-12-710-801	Ground Wing Thermal Anti-Icing (TAI) Solenoid Valve Test (P/B 501)
36-11-03-400-801	Bleed Air Regulator Installation (P/B 401)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
72-23-03-400-802-F00	Shroud Segments Installation (P/B 401)
73-21-00-700-802-F00	FADEC System Test (P/B 501)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	J9 harness	73-21-06-01-031	IDC 001-006
		73-21-06-01A-055	IDC 007-010, 012-999
6	J10 harness	73-21-06-01-033	IDC 001-006
		73-21-06-01A-065	IDC 007-010, 012-999
7	MW0311 harness	71-51-03-01-055	IDC 001-006
		71-51-03-01A-100	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. 3:00 O'clock Strut Harness Installation

SUBTASK 73-21-06-420-004-F00

(1) Do these steps to install the J9 harness [5] (Figure 405, Figure 406):

NOTE: The tasks for the installation of the J9 harness [5], J10 harness [6], and the MW0311 harness [7] can be completed at the same time.

(a) Carefully install the J9 harness [5] through the 3:00 o'clock strut, from the inside to the outside of the engine.

1) Use graphite mineral vaseline, D00601 [CP2101], to lubricate the threads of the bolt [20] and bolt [21].

2) Use the bolt [20] and bolt [21] to install the J9 harness box [23] and J10 harness box [24] to the bracket on the 3:00 o'clock strut.

a) Tighten the bolt [20] and bolt [21] to 98 in-lb (11 N·m) - 110 in-lb (12.4 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Pull the flexible clamp from the 3:00 o'clock strut.
   a) Put the J9 harness [5] in its correct position in the flexible clamp.
4) Install the flexible clamp in the 3:00 o'clock strut.
   a) Make sure that there is no pre-load on the J9 harness [5], J10 harness [6], or MW0311 harness [7].
   b) Make sure that the J9 harness [5] does not touch the other harnesses or structure of the 3:00 o'clock strut.
5) Connect the MW0311 harness [7] in the omega clamps [22] on the J9 harness box [23].

(b) Connect these J9 electrical connectors to their receptacles:
1) EEC, J9 - DP0909
2) VSV position transducer Ch A, DP0902
3) HPTACC valve position transducer Ch A, DP0903
4) LPTACC valve position transducer Ch A, DP0904
5) T3 probe Ch A, DP0905
   a) Tighten the DP0905 connector to 168 in-lb (19 N·m) - 186 in-lb (21 N·m).
   b) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the electrical connector.

IDC ALL PRE SB CFM56-7B 73-44 OR PRE SB 737-CFM56-7B-73-058

6) BSV switch Ch A, DP0906

IDC ALL POST SB 737-CFM56-7B-73-058 OR POST SB CFM56-7B 73-44

7) If it is installed, connect DP0906 to bracket, if it is not installed, disregard this step.

IDC ALL

8) TBV position transducer Ch A, DP0907
9) VBV position transducer Ch A, DP0908
10) T25 sensor Ch A, DP0910
11) CJ9 receptacle, DP0901.

(c) Distribute the slack of the J9 harness [5] along the length of the run.

NOTE: This will make sure that the J9 harness [5] is not damaged by stress.

(d) Do these steps to connect the J9 harness [5] to the engine:
1) Put the J9 harness [5] in the 1/4-turn hinged clamps.
   a) Tighten the 1/4-turn connectors to 62 in-lb (7 N·m) - 71 in-lb (8 N·m).

SUBTASK 73-21-06-420-005-F00

(2) Do these steps to install the J10 harness [6] (Figure 405, Figure 407):

NOTE: The tasks for the installation of the J9 harness [5], J10 harness [6], and the MW0311 harness [7] can be completed at the same time.

(a) Carefully install the J10 harness [6] through the 3:00 o'clock strut, from the inside to the outside of the engine.
1) Use graphite mineral vaseline, D00601 [CP2101], to lubricate the threads of the bolt [20] and bolt [21].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Use the bolt [20] and bolt [21] to install the J9 harness box [23] and J10 harness box [24] to the bracket on the 3:00 o'clock strut.
   a) Tighten the bolt [20] and bolt [21] to 98 in-lb (11 N·m) - 110 in-lb (12.4 N·m).
3) Pull the flexible clamp, with the harnesses, from the 3:00 o'clock strut.
   a) Put the J10 harness [6] in its correct position in the flexible clamp.
4) Install the flexible clamp in the 3:00 o'clock strut.
   a) Make sure that there is no pre-load on the J9 harness [5], J10 harness [6], or MW0311 harness [7].
   b) Make sure that the J10 harness [6] does not touch the other harnesses or the structure of the 3:00 o'clock strut.

(b) Connect these J10 electrical connectors to their receptacles:
1) EEC, J10 - DP1010
2) VSV position transducer Ch B, DP1002
3) HPTACC valve position transducer Ch B, DP1003
4) LPTACC valve position transducer Ch B, DP1004
5) T3 probe Ch B, DP1005
   a) Tighten the DP1005 connector to 168 in-lb (19 N·m) - 186 in-lb (21 N·m).
   b) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the electrical connector.

IDC ALL PRE SB CFM56-7B 73-44 OR PRE SB 737-CFM56-7B-73-058

6) BSV switch Ch B, DP1006

IDC ALL POST SB 737-CFM56-7B-73-058 OR POST SB CFM56-7B 73-44

7) If it is installed, connect DP1006 to bracket, if it is not installed, disregard this step.

IDC ALL

8) TBV position transducer Ch B, DP1007
9) VBV position transducer Ch B, DP1008
10) T25 sensor Ch B, DP1009
11) CJ10 receptacle, DP1001.

(c) Distribute the slack of the J10 harness [6] along the length of the run.

NOTE: This will make sure that the J10 harness [6] is not damaged by stress.

(d) Put the J10 harness [6] in the 1/4-turn hinged clamps.
1) Tighten the 1/4-turn connectors.

SUBTASK 73-21-06-420-006-F00

(3) Do these steps to install the MW0311 harness [7] (Figure 405, Figure 408):

NOTE: The tasks for the installation of the J9 harness [5], J10 harness [6], and the MW0311 harness [7] can be completed at the same time.

(a) Carefully install the MW0311 harness [7] through the 3:00 o'clock strut, from the inside to the outside of the engine.
1) Pull the flexible clamp, with the harnesses, from the 3:00 o'clock strut.
   a) Put the MW0311 harness [7] in its correct position in the flexible clamp.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Install the flexible clamp in the 3:00 o'clock strut.
   a) Make sure that there is no pre-load on the MW0311 harness [7], J9 harness [5], or J10 harness [6].
   b) Make sure that the MW0311 harness [7] does not touch the other harnesses or the structure of the 3:00 o'clock strut.
3) Engage the MW0311 harness [7] in the omega clamp [22] on the J9 harness box [23].

(b) Connect the MW0311 harness [7] electrical connectors to their receptacles:
1) Bleed air controller, DP1102
2) Ground wing thermal anti-ice solenoid valve, DP1103
3) FFCC vibration sensor, DP1101
4) Engine disconnect panel, DP1104.

(c) Distribute the slack of the MW0311 harness [7] along the length of the run.

NOTE: This will make sure that the MW0311 harness [7] is not damaged by stress.

(d) Do these steps to connect the MW0311 harness [7] to the engine:
1) Put the MW0311 harness [7] in the 1/4-turn hinged clamps.
   a) Tighten the 1/4-turn connectors to 62 in-lb (7 N·m) - 71 in-lb (8 N·m).

SUBTASK 73-21-06-410-001-F00

(4) Do these steps to install the 3:00 o'clock strut fairing [10] on the 3:00 o'clock strut (Figure 405):

CAUTION MAKE SURE THAT THE HARNESSES ARE IN THE CORRECT POSITION IN THE FIREWALLS. IF THE HARNESSES ARE NOT IN THE CORRECT POSITION, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(a) Install the lower lower half-firewall [17]:
1) Use graphite mineral vaseline, D00601 [CP2101], to lubricate the threads of the bolts [12].
2) Use the bolts [12] to connect the lower half-firewall [17] to the 3:00 o'clock strut.
   a) Tighten the bolts [12] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

(b) Install the metal plug [18].

(c) Install the upper half-firewall [16] (SIN 9510Z):
1) Use graphite mineral vaseline, D00601 [CP2101], to lubricate the threads of the bolts [15].
2) Connect it to the lower half-firewall [17] with the bolts [15].
   a) Tighten the bolts [15] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

(d) Put the 3:00 o'clock strut seal [14] in its correct position on the 3:00 o'clock strut.
1) Use the bolts [19] and the washers [13] to install the 3:00 o'clock strut seal [14] on the 3:00 o'clock strut.
   a) Tighten the bolts [19] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

(e) Put the 3:00 o'clock strut fairing [10] in its correct position on the 3:00 o'clock strut.
1) Use the screws [11] to connect the 3:00 o'clock strut fairing [10] to the 3:00 o'clock strut.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) Tighten the screws [11] to 30 in-lb (3.4 N·m) - 35 in-lb (4 N·m).

(f) Install the lower-left inner panel of the thrust reverser extension ring (TASK 72-23-03-400-802-F00).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 73-21-06-840-004-F00

(1) Do these steps:

(a) For engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
A	6	C00148	ANTI-ICE & RAIN ENG 1 & WING CONT

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES L

(b) For engine 2, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
B	6	C00149	ANTI-ICE & RAIN ENGINE 2 CONTROL

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES R

(c) Do this test after the installation of the harnesses:

1) For the J9 harness [5] and J10 harness [6].

a) Do this task: FADEC System Test, TASK 73-21-00-700-802-F00.

2) For the MW0311 harness.

a) Do this task: FADEC System Test, TASK 73-21-00-700-802-F00.

b) Do a test of the bleed air regulator (TASK 36-11-03-400-801).

c) Do this task: Ground Wing Thermal Anti-Icing (TAI) Solenoid Valve Test, TASK 30-11-12-710-801.

d) Do a test of the FFCC vibration sensor (TASK 71-00-00-800-811-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(d) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK

TASK 73-21-06-000-803-F00

6. Core Engine Harness Removal

(Figure 409, Figure 410)

A. General

(1) The core engine harnesses are the CJ9 and the CJ10 harnesses.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-21-06-860-002-F00

(1) Do these steps to prepare for the procedure:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

WARNING DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Core Engine Harness Removal

SUBTASK 73-21-06-020-009-F00

(1) Do these steps to remove the CJ9 harness [8] (Figure 409):

IDC ALL (PRE SB 737-CFM56-7B-73-0089 AND PRE SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198

(a) Disconnect these electrical connectors:

1) The right T49.5 thermocouple harness, DP0912 and DP0913
2) TCC sensor, DP0914
3) The T5 sensor, DP0915
4) J9 harness, DP0911.

IDC ALL (POST SB 737-CFM56-7B-73-0089 AND PRE SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198

(b) Disconnect these electrical connectors:

1) The right T49.5 thermocouple harness, DP0912 and DP0913
2) The T5 sensor, DP0915
3) J9 harness, DP0911.

IDC ALL (POST SB 737-CFM56-7B-73-0089 AND POST SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198

(c) Disconnect these electrical connectors:

1) The right T49.5 thermocouple harness, DP0912 and DP0913
2) J9 harness, DP0911.

IDC ALL

(d) Remove the two bolts that hold the CJ9 junction box to the bracket.

NOTE: The CJ9 junction box is found on the engine core at the 1:00 o'clock position.

(e) Remove the nuts, bolts, washers, and clamps that hold the CJ9 harness [8] to the engine.

NOTE: Make a note of the locations and orientation of all of the parts that hold the CJ9 harness. The part location and orientation are important for the subsequent installation.

1) Remove the CJ9 harness [8] from the engine.

SUBTASK 73-21-06-020-010-F00

(2) Do these steps to remove the CJ10 harness [9] (Figure 410):

(a) Disconnect these electrical connectors:

1) Left T49.5 thermocouple harness connections, DP1012 and DP1013
2) J10 harness electrical connector, DP1011.

(b) Remove the two bolts that hold the CJ10 junction box to the bracket.

NOTE: The CJ10 junction box is found on the engine core at the 1:00 o'clock position.

(c) Remove the nuts, bolts, washers, and clamps that hold the CJ10 harness [9] to the engine.

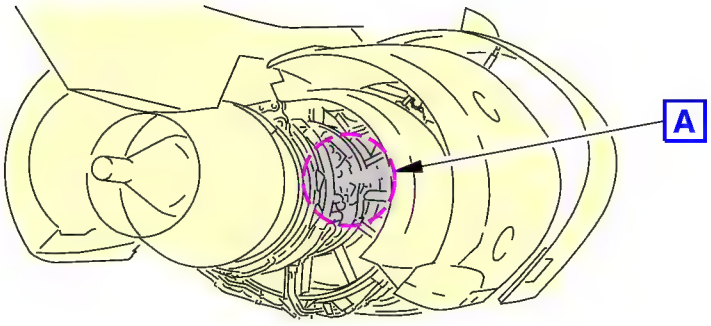
NOTE: Make a note of the locations and orientation of all of the parts that hold the CJ10 harness. The part location and orientation are important for the subsequent installation.

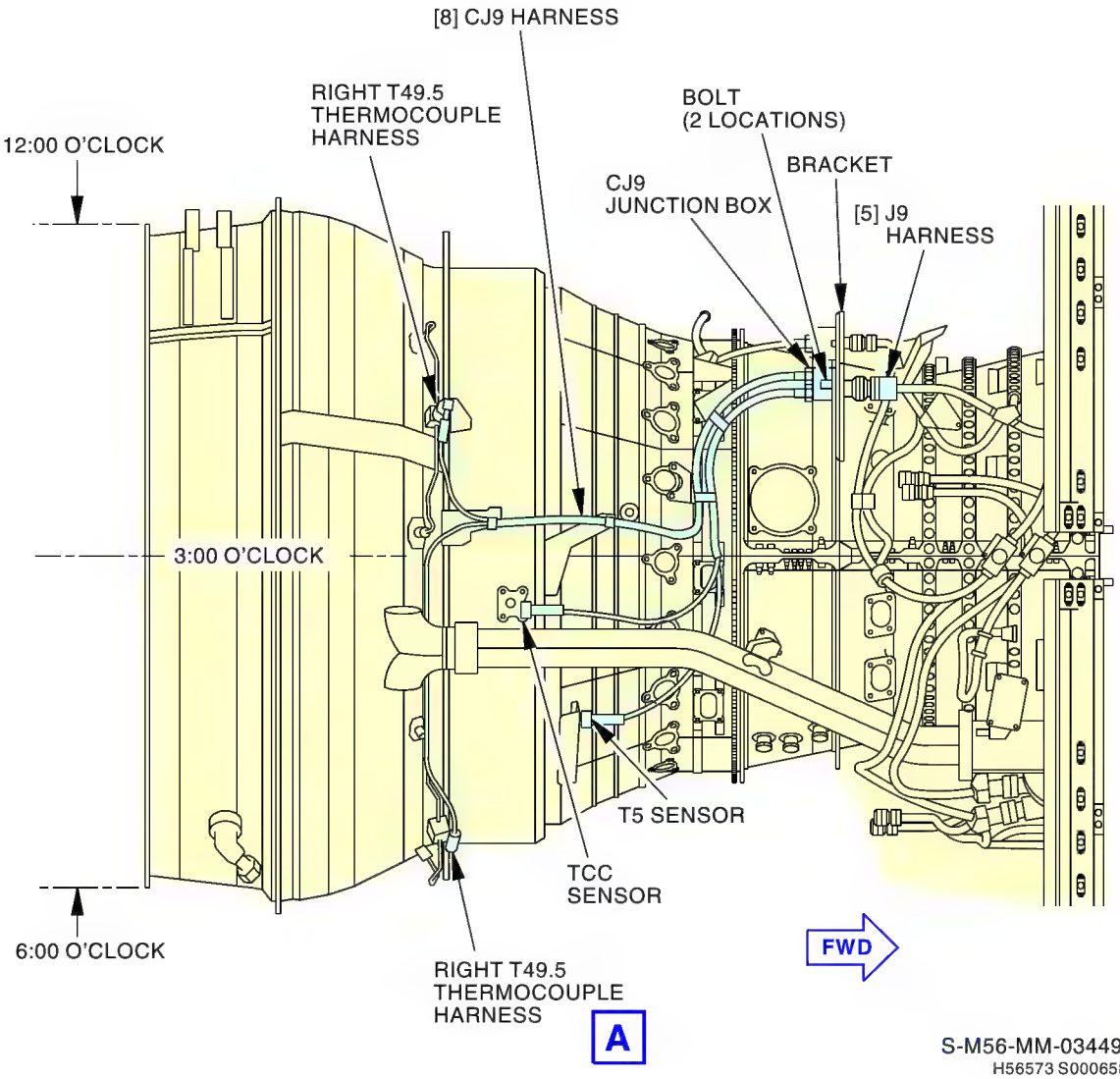
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Remove the CJ10 harness [9] from the engine.

——— END OF TASK ———

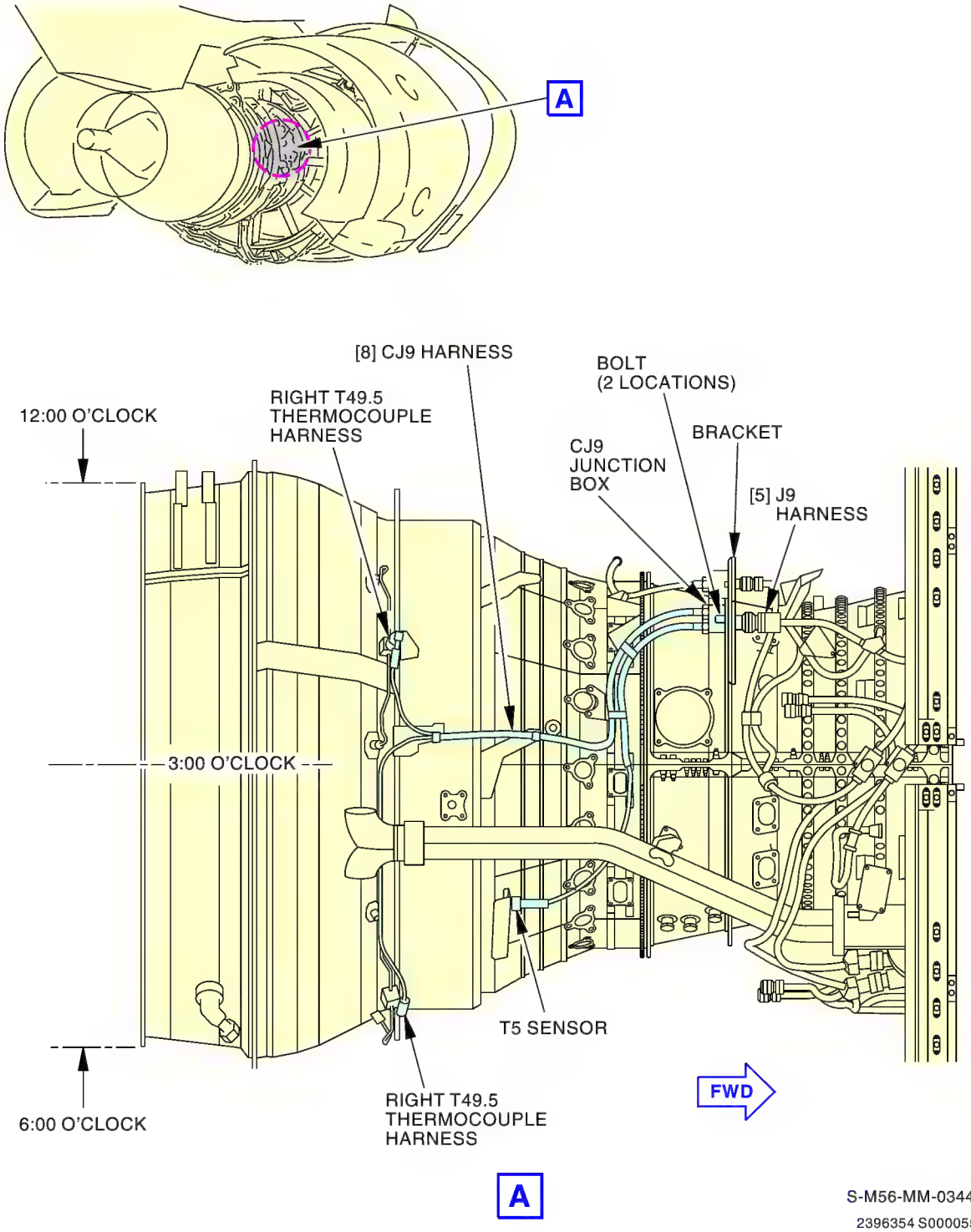
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details





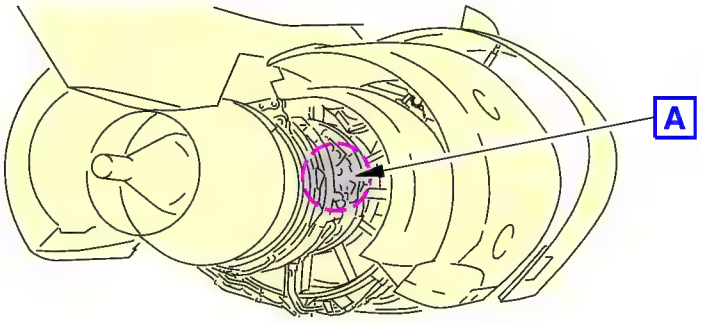
CJ9 Harness Installation
Figure 409/73-21-06-990-809-F00 (Sheet 1 of 3)

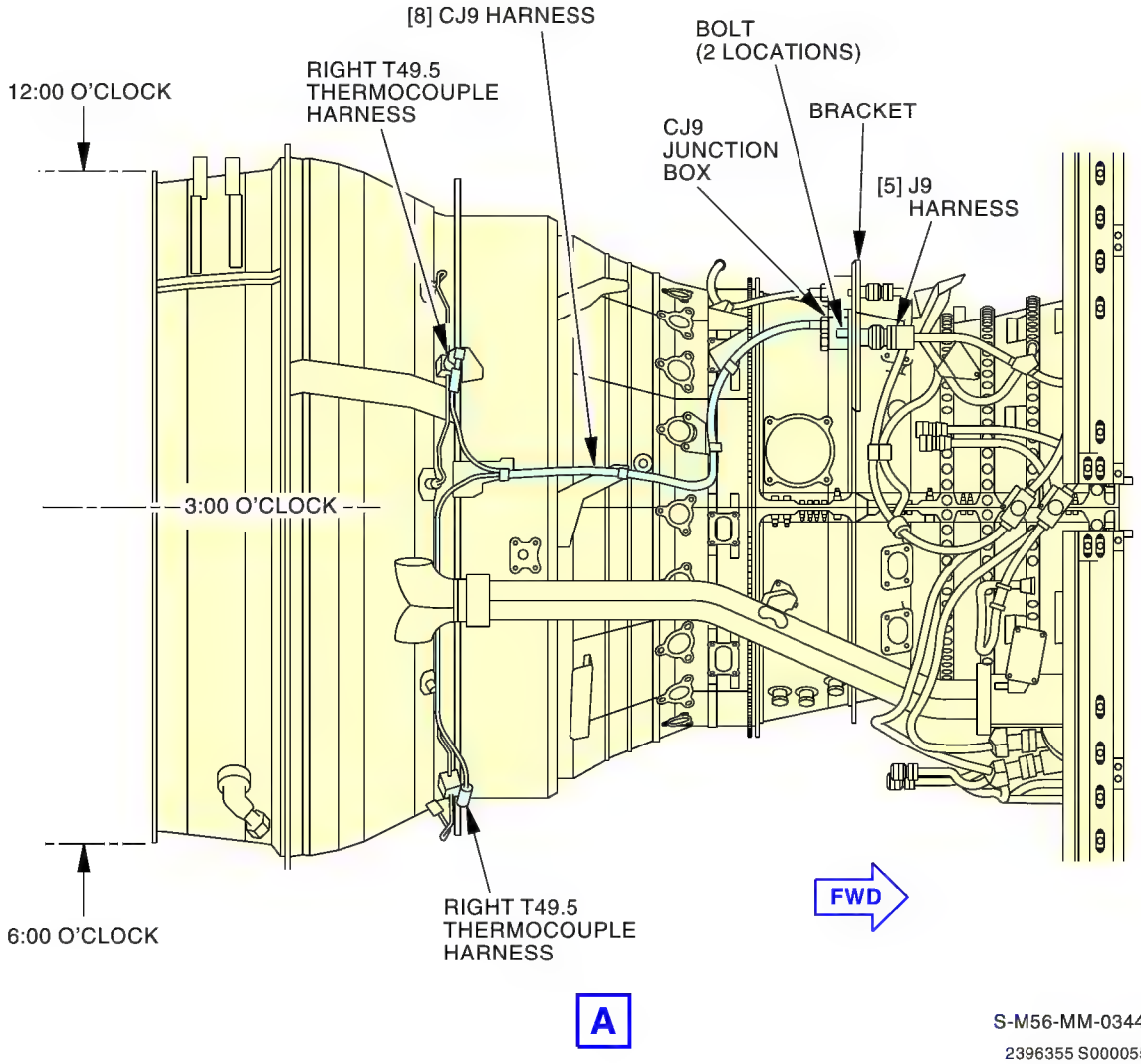
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



CJ9 Harness Installation
Figure 409/73-21-06-990-809-F00 (Sheet 2 of 3)

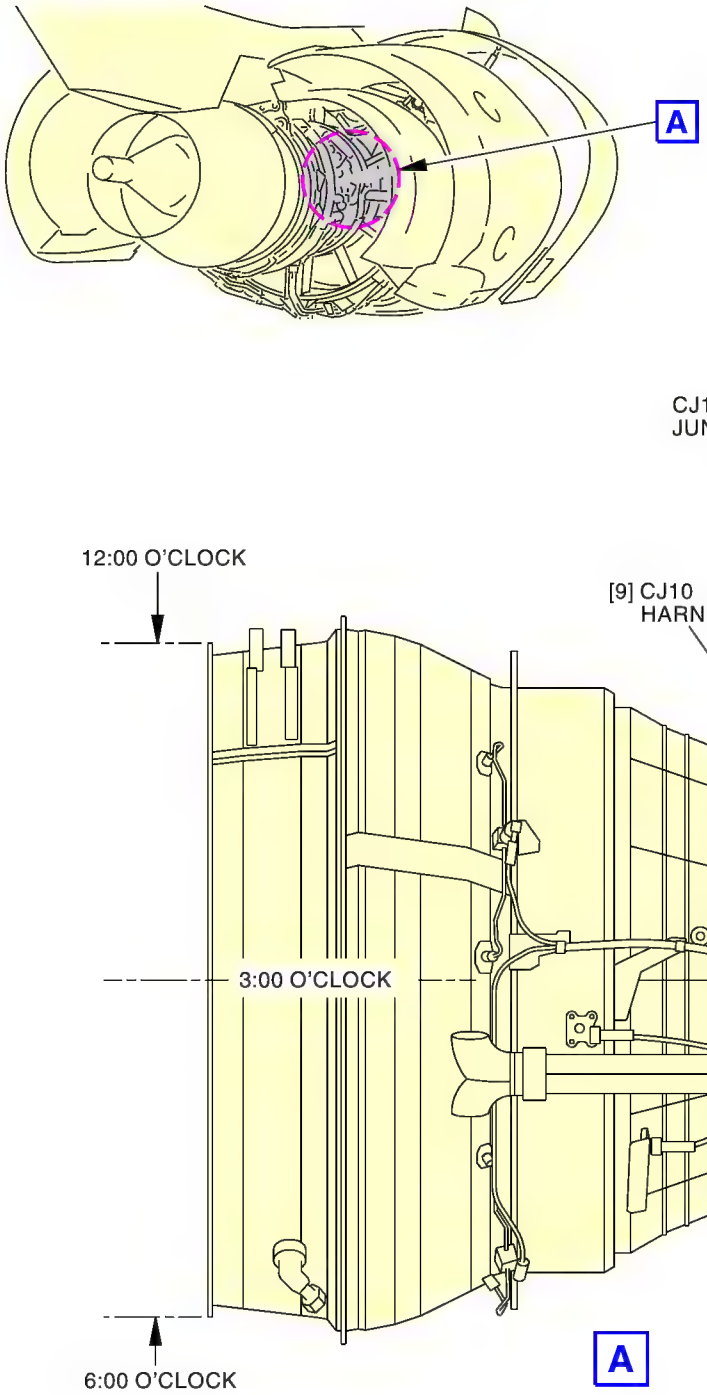
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details





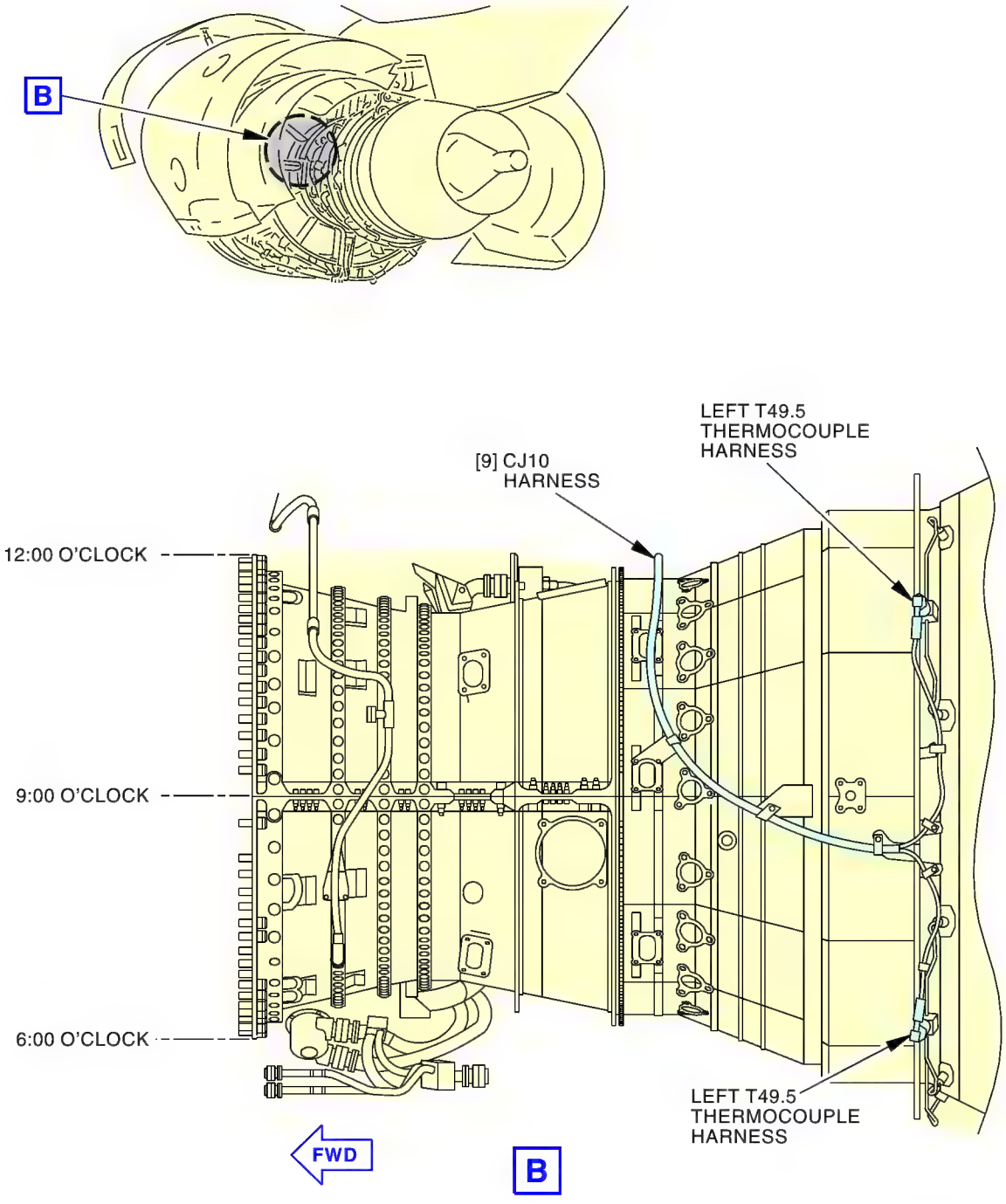
CJ9 Harness Installation
Figure 409/73-21-06-990-809-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



CJ10 Harness Installation
Figure 410/73-21-06-990-810-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



S-M56-MM-03451-00-B
F34792 S0006582815_V2

CJ10 Harness Installation
Figure 410/73-21-06-990-810-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-06-400-803-F00

7. Core Engine Harness Installation

(Figure 409, Figure 410)

A. References

Reference	Title
73-21-00-700-802-F00	FADEC System Test (P/B 501)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Harness	73-21-06-01-145	IDC 001-006
		73-21-06-01A-200	IDC 007-010, 012-999
9	Harness	73-21-06-01-185	IDC 001-006
		73-21-06-01A-250	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Core Engine Harness Installation

SUBTASK 73-21-06-420-007-F00

(1) Do these steps to install the CJ9 harness [8]:

(a) Put the CJ9 harness [8] in its correct position on the engine.

(b) Use the 2 bolts to install the CJ9 junction box to the bracket.

1) Tighten the bolts to 98-110 pound-inches (11-12.5 Newton-meters).

IDC ALL (PRE SB 737-CFM56-7B-73-0089 AND PRE SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198

(c) Connect these CJ9 harness electrical connectors (Figure 409):

1) The right T49.5 thermocouple harness, DP0912 and DP0913

a) Tighten the electrical connectors for the right T49.5 thermocouples to 133-177 pound-inches (15-20 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on these electrical connectors.

2) TCC sensor, DP0914

a) Tighten the electrical connectors for the TCC sensor to 168-186 pound-inches (19-21 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on these electrical connectors.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL (PRE SB 737-CFM56-7B-73-0089 AND PRE SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198 (Continued)

3) The T5 sensor, DP0915

a) Tighten the electrical connectors for the T5 sensor to 168-186 pound-inches (19-21 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on these electrical connectors.

4) J9 harness, DP0911.

IDC ALL (POST SB 737-CFM56-7B-73-0089 AND PRE SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198

(d) Connect these CJ9 harness electrical connectors (Figure 409):

1) The right T49.5 thermocouple harness, DP0912 and DP0913

a) Tighten the electrical connectors for the right T49.5 thermocouples to 133-177 pound-inches (15-20 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on these electrical connectors.

2) The T5 sensor, DP0915

a) Tighten the electrical connectors for the T5 sensor to 168-186 pound-inches (19-21 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on these electrical connectors.

3) J9 harness, DP0911.

IDC ALL (POST SB 737-CFM56-7B-73-0089 AND POST SB 737-CFM56-7B-73-0142) OR POST SB 737-CFM56-7B-73-0198

(e) Connect these CJ9 harness electrical connectors (Figure 409):

1) The right T49.5 thermocouple harness, DP0912 and DP0913

a) Tighten the electrical connectors for the right T49.5 thermocouples to 133-177 pound-inches (15-20 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on these electrical connectors.

2) J9 harness, DP0911.

IDC ALL

(f) Distribute the slack of the harness along the length of the run.

NOTE: This will make sure that the harness is not damaged by stress.

(g) Do these steps to connect the wire harness to the fan case:

1) Use graphite mineral vaseline, D00601 [CP2101] to lubricate the threads of the bolts.

2) Use the bolts, washers, nuts, and clamps to connect the harness to the engine.

a) Tighten the bolts to 98-110 pound-inches (11-12.5 Newton-meters).

SUBTASK 73-21-06-420-008-F00

(2) Do these steps to install the CJ10 harness [9] (Figure 410):

(a) Put the CJ10 harness [9] in its correct position on the engine.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Use the two bolts to install the CJ10 junction box to the bracket.

1) Tighten the bolts to 98-110 pound-inches (11-12.5 Newton-meters).

(c) Connect these electrical connectors:

1) The left T49.5 thermocouple harness connectors, DP1012 and DP1013

a) Tighten the electrical connectors to 133-177 pound-inches (15-20 Newton-meters).

b) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006] on the electrical connectors.

2) The J10 harness electrical connector, DP1011.

(d) Distribute the slack of the harness along the length of the run.

NOTE: This will make sure that the harness is not damaged by stress.

(e) Do these steps to connect the wire harness to the engine:

1) Use graphite mineral vaseline, D00601 [CP2101], to lubricate the threads of the bolts.

2) Use the bolts, washers, nuts, and clamps to connect the harness to the engine.

a) Tighten the bolts to 98-110 pound-inches (11-12.5 Newton-meters).

F. Installation Test

SUBTASK 73-21-06-840-005-F00

(1) Prepare for the Test:

(a) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-06-710-001-F00

(2) Do this task: FADEC System Test, TASK 73-21-00-700-802-F00.



WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN AND CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WIRING HARNESSES - REPAIR

1. General

A. This procedure contains two tasks:

(1) The first task is to repair worn CJ9 and CJ10 wiring harnesses

(2) The second task is to temporarily repair the heat-shrinkable sleeves on J5, J6, J7 and J8 harnesses.

TASK 73-21-06-300-801-F00

2. Repair of Worn CJ9 and CJ10 Wiring Harnesses

A. General

(1) Refer to this procedure, Engine Wiring Harnesses Repair, TASK 70-70-01-350-801-F00.

B. References

Reference	Title
70-70-01-350-801-F00	Engine Wiring Harnesses Repair (P/B 801)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

——— END OF TASK ———

TASK 73-21-06-300-802-F00

3. Repair of the Heat-Shrinkable Sleeves

(Figure 801, Figure 802)

A. General

(1) This procedure is a temporary repair of the heat-shrinkable sleeves.

B. References

Reference	Title
73-21-06-000-801-F00	Fan Wiring Harness Removal (P/B 401)
73-21-06-400-801-F00	Fan Wiring Harness Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-6941	Band Tool - Manual, 1/4 in bands used to terminate EMI/RFI shielding materials. Part #: DBS-1101 Supplier: 11851 Part #: STS-1102 Supplier: 07418
COM-14888	Tool - Banding Part #: 449-833 Supplier: 70847 Part #: A40199 Supplier: 70847

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

D. Consumable Materials

Reference	Description	Specification
G51386	Clamp - Band, Flat, Stainless .240 x 14.25	

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare the harnesses for repair

SUBTASK 73-21-06-840-007-F00

(1) Refer to Fan Wiring Harness Removal, TASK 73-21-06-000-801-F00:

(a) Disconnect the J5 and J6 harnesses from the N2 Sensor.

(b) Disconnect the J7 and J8 harnesses from the Alternator.

(c) Verify the correct orientation of the master key (Refer to Figure 801).

NOTE: No movement or rotation of the heat-shrinkable sleeve is permitted.

G. Procedure

SUBTASK 73-21-06-300-001-F00

CAUTION MAKE SURE THAT THE CLAMP BAND HEAD IS NOT INSTALLED OVER THE GROUNDING STRAND WIRES. IF THE CLAMP BAND HEAD IS INSTALLED OVER THE GROUNDING STRAND WIRES DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION MAKE SURE THAT THE END OF THE CLAMP BAND IS NOT FOLDED WITH A MALLET OR WITH PLIERS. IF THE END OF THE CLAMP BAND IS FOLDED WITH A MALLET OR WITH PLIERS DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Install a clamping band, G51386 on the shoulder of the adapter to attach the connector and the heat-shrinkable sleeve at the same time (Refer to Figure 802):

(a) Wind the clamping band, G51386 around the heat-shrinkable sleeve two times.

NOTE: The clamping band is engaged in the head at each turn.

(b) Put the end of the clamping band, G51386 on the banding tool, COM-14888, or on the manual band tool, COM-6941.

(c) Tighten and fold the clamping band, G51386 with the banding tool, COM-14888, or on the manual band tool, COM-6941.

(d) Cut the excess length of the clamping band, G51386 with the banding tool, COM-14888, or with the manual band tool, COM-6941.

(e) Fold back the end of the clamp band on the head side with an aluminum drift.

H. Harnesses installation

SUBTASK 73-21-06-300-002-F00

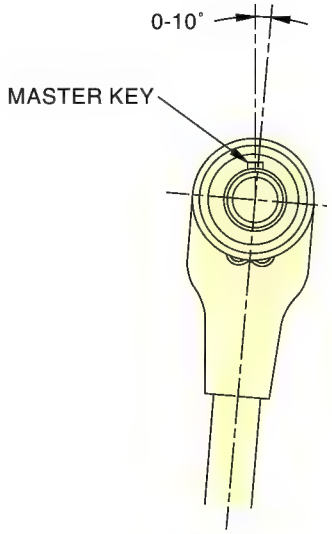
(1) Refer to Fan Wiring Harness Installation, TASK 73-21-06-400-801-F00:

(a) Connect the J5 and J6 harnesses from the N2 Sensor.

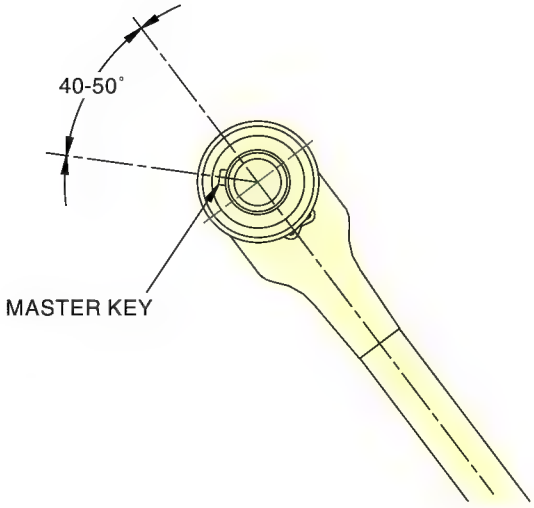
(b) Connect the J7 and J8 harnesses from the Alternator.

END OF TASK

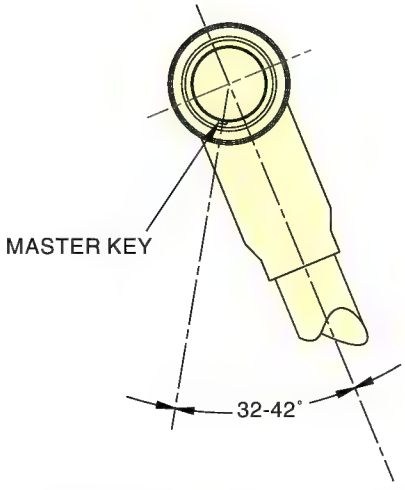
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



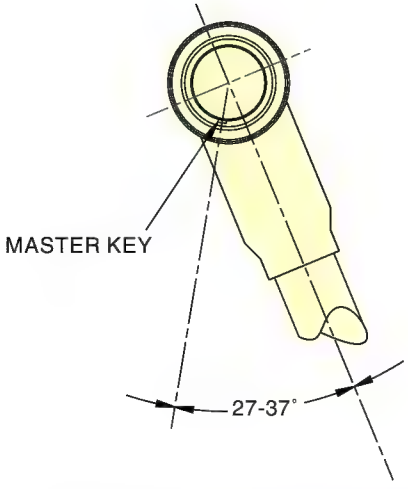
J5 HARNESS AT N2 SENSOR-A LOCATION



J6 HARNESS AT N2 SENSOR-B LOCATION



J7 HARNESS AT ALTERNATOR-A LOCATION

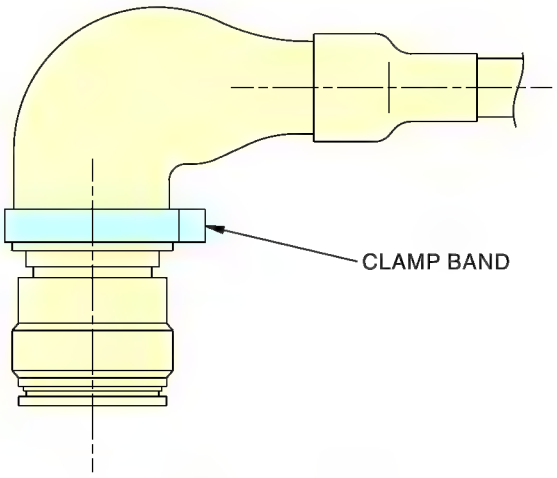


J8 HARNESS AT ALTERNATOR-B LOCATION

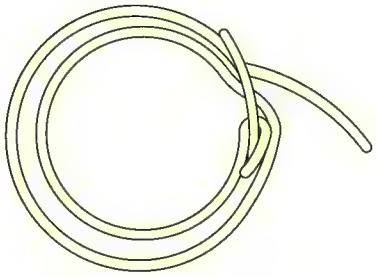
2500320 S0000586572_V1

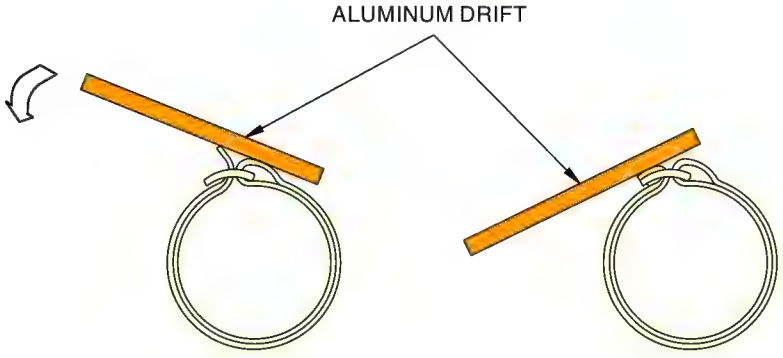
Orientation of the Master Keys
Figure 801/73-21-06-990-814-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



CLAMP BAND BEFORE TIGHTENING





2500321 S0000586574_V1

Installation of the Clamp Band
Figure 802/73-21-06-990-815-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

T3 SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the T3 sensor

(2) The installation of the T3 sensor.

TASK 73-21-07-000-801-F00

2. T3 Sensor Removal

(Figure 401)

A. General

(1) This is the removal task for the T3 sensor.

(2) The T3 sensor is on the right side of the engine, at the 1:00 o'clock position.

B. References

Reference	Title
36-12-01-800-801	Bleed Air Precooler Disconnection (For Engine Component Removal) (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the procedure

SUBTASK 73-21-07-840-001-F00

(1) Do these steps to prepare for the procedure:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) For the right thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

(d) Disconnect the precooler duct to get access to the T3 sensor conduit (TASK 36-12-01-800-801).

(e) Do these steps to remove the CJ9 junction box:

1) Disconnect the electrical connector from the CJ9 junction box.
2) Remove the two bolts that hold the CJ9 junction box to the support bracket.
3) Move the CJ9 junction box out of the way of the T3 sensor interface box.

E. T3 Sensor Removal

SUBTASK 73-21-07-020-001-F00

(1) Do these steps to remove the T3 sensor:

(a) Do these steps to remove these electrical connectors from the T3 sensor:

1) Disconnect the electrical connector DP0905 [3] from the T3 sensor receptacle [1].
2) Disconnect the electrical connector DP1005 [4] from the T3 sensor receptacle [2].

(b) Do these steps to remove the three clamps [7]:

1) Remove the three bolts [8] that hold the three clamps [7] to the three brackets.
2) Remove the clamps [7].

(c) Do these steps to remove the T3 Sensor [9]:

1) Remove the four bolts [10].
2) Remove the two bolts [5] that hold the T3 sensor interface box [6] to the support bracket.

CAUTION MAKE SURE THAT YOU DO NOT DAMAGE THE SENSOR WHILE YOU REMOVE OR INSTALL IT. IF YOU ARE NOT CAREFUL, YOU CAN CAUSE DAMAGE TO THE SENSOR AND THE SENSOR CONDUIT.

3) Remove the T3 sensor [9].
4) Remove the preformed packing [12].
5) Examine the preformed packing [12] to make sure that it is serviceable (TASK 70-30-01-910-802-F00).

a) If the preformed packing [12] is damaged, replace it.
b) If the preformed packing [12] is not damaged, keep it for the subsequent installation.

(d) Install a protective cover on all of these openings:

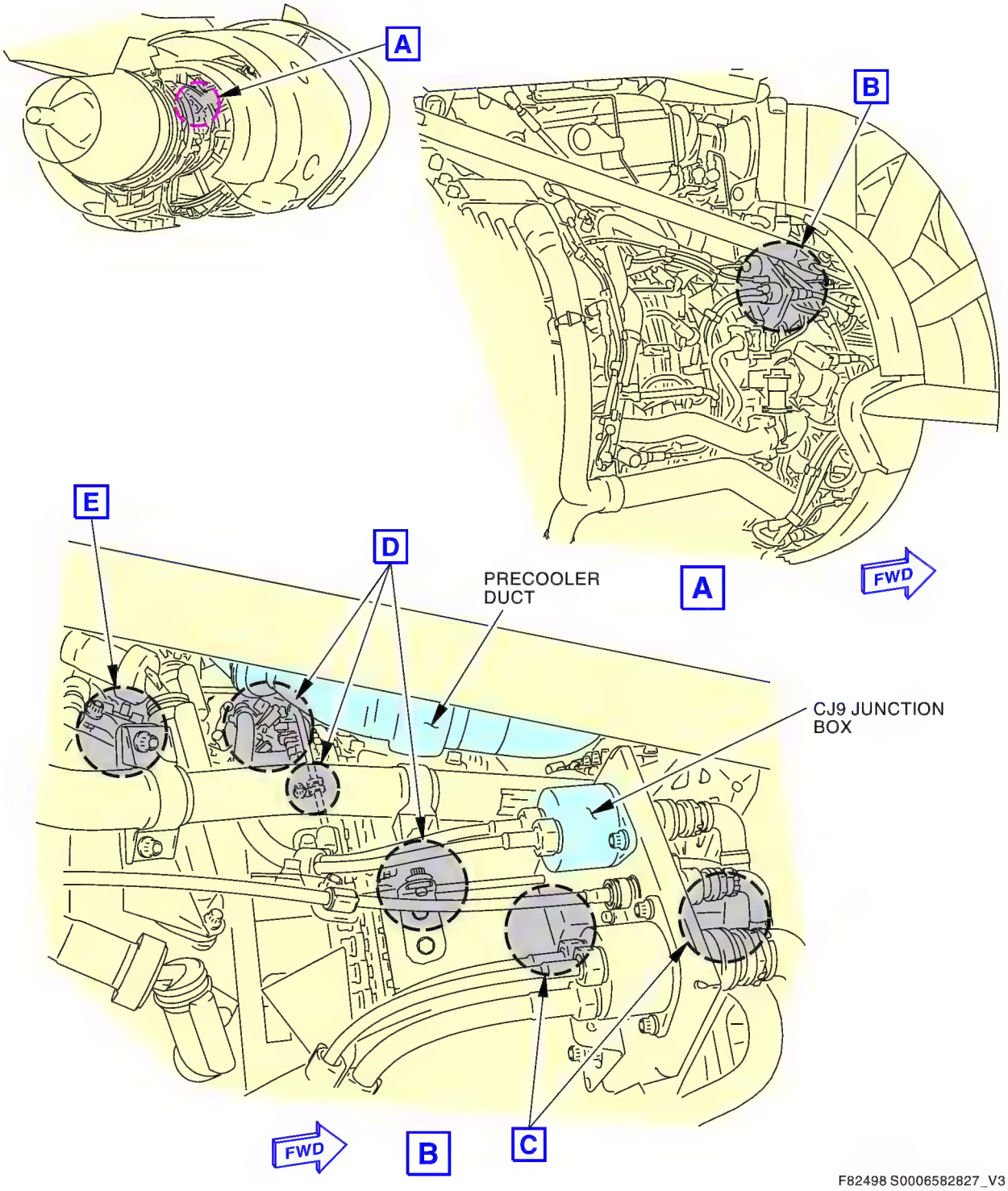
1) The T3 sensor probe [11]
2) The electrical receptacles [1] and [2]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) The electrical connectors [3] and [4]
4) The T3 sensor boss.

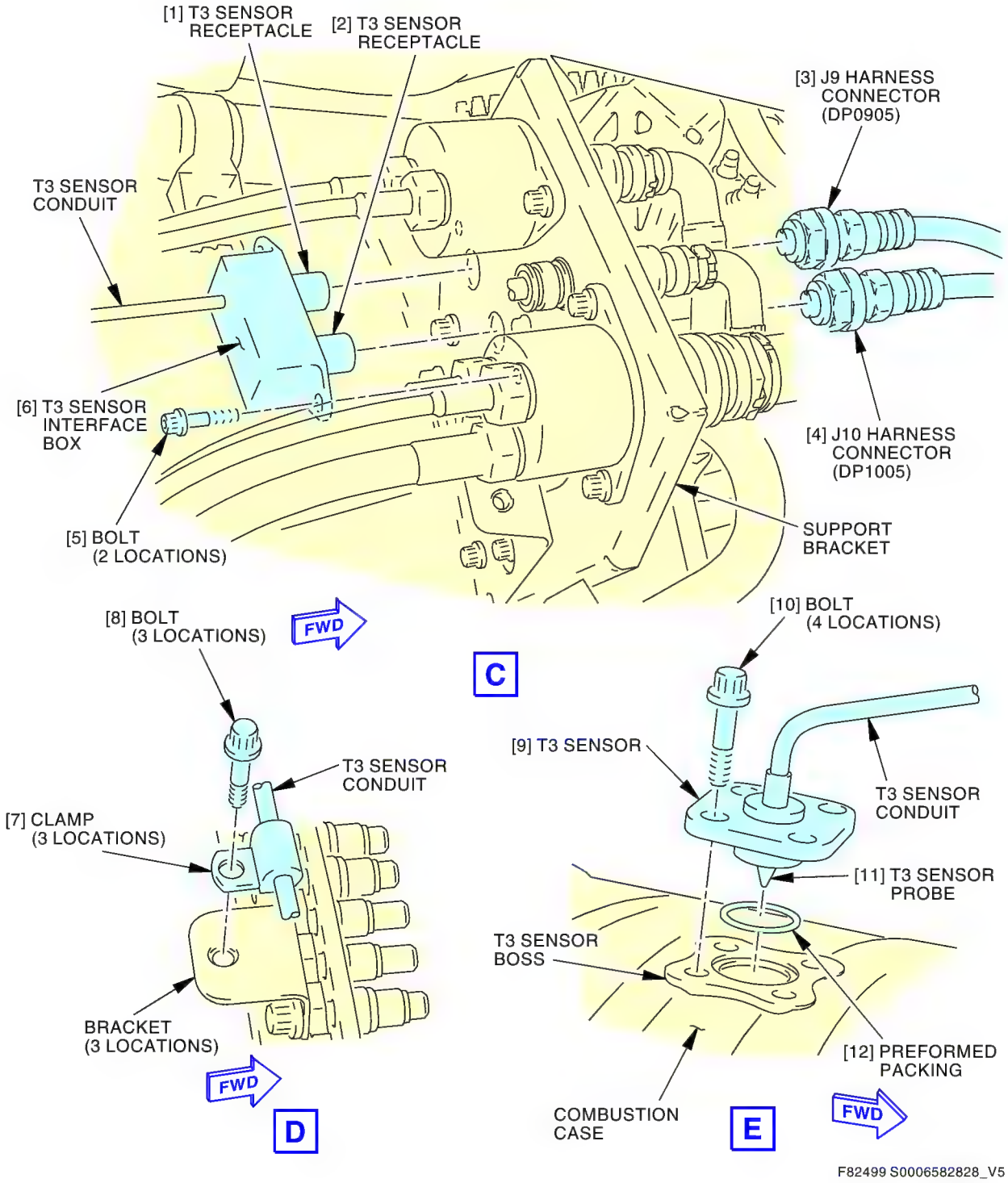
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



T3 Sensor Installation
Figure 401/73-21-07-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



T3 Sensor Installation
Figure 401/73-21-07-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-07-400-801-F00

3. T3 Sensor Installation

(Figure 401)

A. References

Reference	Title
36-12-01-400-801	Bleed Air Precooler Reconnection (After Engine Component Installation) (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	T3 Sensor	73-21-07-01-030	IDC 001-010, 012-999
12	Preformed packing	73-21-07-01-035	IDC 001-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Procedure

SUBTASK 73-21-07-840-002-F00

(1) Do these steps to prepare for the installation:

(a) Examine the mating surfaces for the T3 sensor [9] to make sure that they clean and free of damage.

1) If it is necessary, clean or repair the mating surfaces.

(b) Lubricate the threads of the bolts [5], [8] and [10] with graphite mineral vaseline, D00601 [CP2101].

F. T3 Sensor Installation

SUBTASK 73-21-07-420-001-F00

CAUTION MAKE SURE THAT YOU DO NOT DAMAGE THE SENSOR WHILE YOU REMOVE OR INSTALL IT. IF YOU ARE NOT CAREFUL, YOU CAN CAUSE DAMAGE TO THE SENSOR AND THE SENSOR CONDUIT.

(1) Do these steps to install the T3 sensor [9]:

(a) Remove the protective cover from the T3 sensor probe [11].

(b) Put the preformed packing [12] in its correct position on the T3 sensor boss.

(c) Put the T3 Sensor [9] on the sensor boss.

(d) Put the T3 sensor interface box [6] in the support bracket.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Use your fingers to install the four bolts [10] that attach the T3 sensor [9] to the sensor boss.

1) Do not tighten the bolts [10] at this time.

(f) Use your fingers to install the two bolts [5] that hold the T3 sensor interface box [6] to the support bracket.

(g) Examine the T3 sensor [9] and the sensor interface box [6] to make sure that they are in their correct positions.

(h) Tighten the bolts [5] and [10] to 62-68 pound-inches (7.0-8.0 Newton meters).

1) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the four bolts [10].

(i) Do these steps to install the three clamps [7]:

1) Install the three bolts [8] to connect the three clamps [7] in their correct positions on the T3 sensor conduit.

2) Tighten the bolts [8] to 62-68 pound-inches (7.0-8.0 Newton meters).

(j) Do these steps to install the electrical connectors on the T3 sensor:

1) Install the electrical connector DP0905 [3] on the T3 sensor receptacle [1].

a) Tighten the electrical connector to 168-186 pound inches (19-21 Newton-meters).

b) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the electrical connector.

2) Install the electrical connector DP1005 [4] on the T3 sensor receptacle [2].

a) Tighten the electrical connector to 168-186 pound inches (19-21 Newton-meters).

b) Install lockwire on the electrical connector.

(k) Do these steps to install the CJ9 junction box:

1) Lubricate the threads of the two bolts that hold the CJ9 junction box with graphite mineral vaseline, D00601 [CP2101].

2) Put the CJ9 junction box in its correct position on the support bracket.

3) Use the two bolts to connect the CJ9 junction box to the support bracket.

a) Tighten the bolts to 62-68 pound-inches (7.0-8.0 Newton meters).

4) Connect the electrical connector from the CJ9 junction box.

(l) Reconnect the precooler duct (TASK 36-12-01-400-801).

G. T3 Sensor Installation Test

SUBTASK 73-21-07-720-001-F00

(1) Do these steps for the T3 sensor installation test:

(a) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

H. Put the Airplane in a Serviceable Condition

SUBTASK 73-21-07-840-004-F00

WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) For the right thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

ELECTRONIC ENGINE CONTROL (EEC) ALTERNATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the EEC alternator and alternator rotor

(2) An installation of the EEC alternator and alternator rotor.

TASK 73-21-08-000-801-F00

2. EEC Alternator and Alternator Rotor Removal

(Figure 401)

A. General

(1) The EEC alternator is on the forward side of the Accessory Gearbox (AGB) at the 9:00 o'clock position.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
72-63-01-000-801-F00	Handcranking Drive Cover Removal (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8025	Pins - Guide, A.C. Generator Stator Part #: 856A2953G01 Supplier: 58828
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 73-21-08-840-001-F00

(1) Make sure that the applicable start lever is in the CUTOFF position.

(a) Install a DO NOT OPERATE tag, STD-858.

SUBTASK 73-21-08-840-003-F00

(2) Set the start switch to the OFF position.

SUBTASK 73-21-08-840-004-F00

(3) For engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-08-840-005-F00

(4) For engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 73-21-08-840-006-F00

(5) Install a DO NOT OPERATE tag, STD-858, on the start switch.

SUBTASK 73-21-08-010-001-F00

(6) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. EEC Alternator and Alternator Rotor Removal

SUBTASK 73-21-08-020-001-F00

(1) Do these steps to remove the EEC alternator [1]:

(a) Disconnect the J7 harness connector [16] and J8 harness connector [15] from the EEC alternator [1] receptacles.

(b) Remove the three bolts [2] and three washers [3] that hold EEC alternator [1] to the AGB pad.

CAUTION MAKE SURE THAT YOU USE THE GUIDE PINS. IF YOU DO NOT USE THE GUIDE PINS TO REMOVE OR INSTALL THE ALTERNATOR, DAMAGE TO THE ROTOR AND THE STATOR OF THE ALTERNATOR CAN OCCUR.

(c) Install the A.C. generator stator guide pins, SPL-8025, through the bolt holes of the EEC alternator [1].

NOTE: If the guide pins are not available, you can make the guide pins from 0.25 inch (6.35 mm) diameter steel stock that is approximately 4 inches (100 mm) long. Put 1/4-28 threads on one end.

1) Thread the guide pins into the AGB pad.

(d) Carefully slide the EEC alternator [1] forward, over the guide pins.

(e) Remove the EEC alternator [1].

(f) Remove the A.C. generator stator guide pins, SPL-8025, from the AGB pad.

(g) Remove the O-ring [5].

1) Discard the O-ring [5].

(h) Do this task: Handcranking Drive Cover Removal, TASK 72-63-01-000-801-F00.

(i) Install a 3/4-inch drive tool into the handcranking drive.

1) Use the 3/4-inch drive tool to prevent the rotation of the AGB gearshaft [7].

(j) Remove and discard the self-locking nut [4] from the alternator rotor [6].

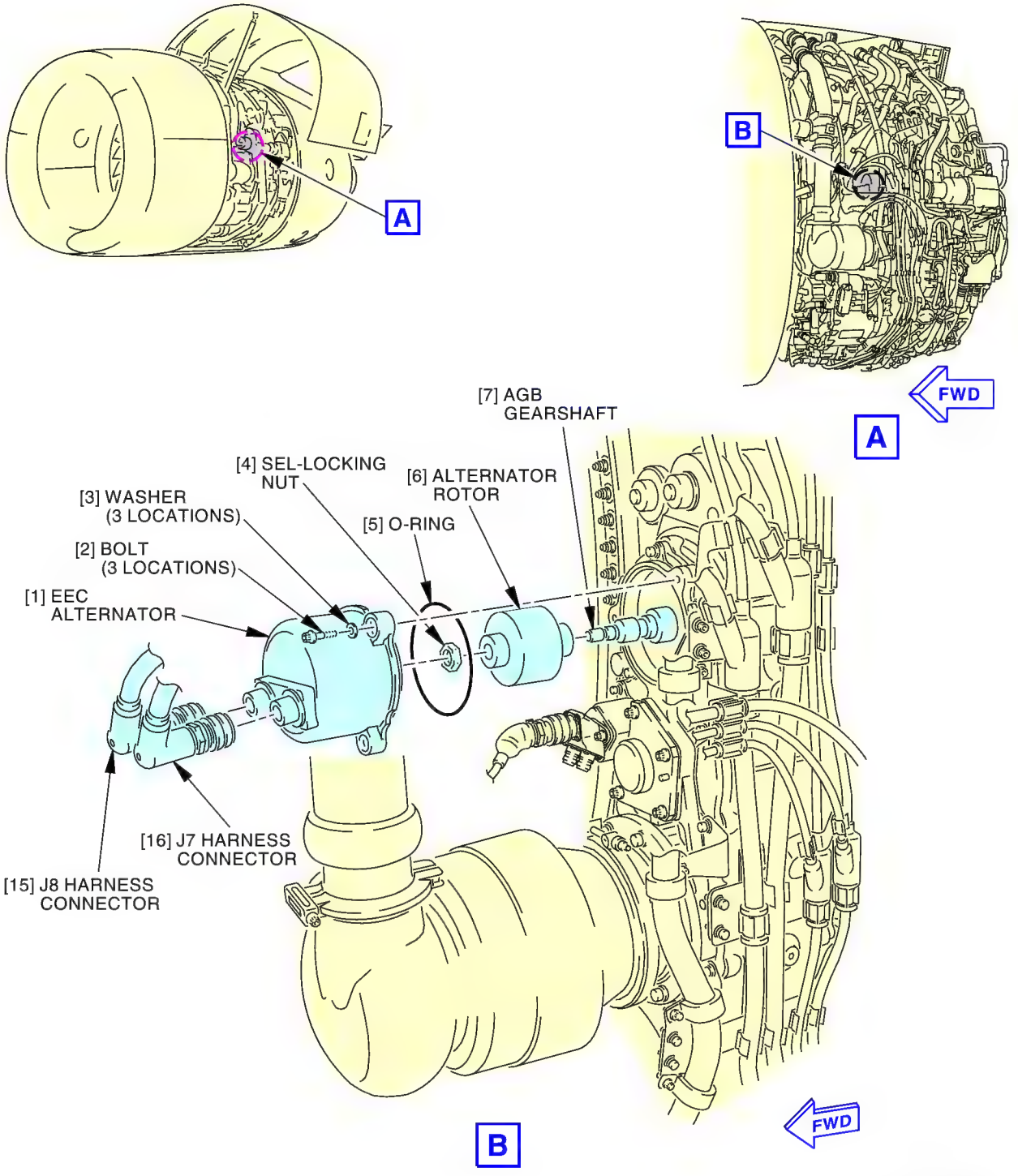
(k) Remove the alternator rotor [6].

(l) Remove the 3/4-inch drive tool from the handcranking drive.

(m) Install protective covers on the alternator rotor [6], EEC alternator [1], handcranking drive pad, and end of the AGB gearshaft [7].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



EEC Alternator Installation
Figure 401/73-21-08-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-08-400-801-F00

3. EEC Alternator and Alternator Rotor Installation

(Figure 401)

A. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
72-63-01-400-801-F00	Handcranking Drive Cover Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8025	Pins - Guide, A.C. Generator Stator Part #: 856A2953G01 Supplier: 58828

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	CFM CP2442
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	EEC alternator	73-21-08-01-065	IDC 001-006
		73-21-08-01-070	IDC 001-006
		73-21-08-01A-065	IDC 007-010, 012-999
		73-21-08-01A-070	IDC 007-010, 012-999
4	Self-locking nut	73-21-08-01-075	IDC 001-006
		73-21-08-01A-075	IDC 007-010, 012-999
5	O-ring	73-21-08-01-060	IDC 001-006
		73-21-08-01A-060	IDC 007-010, 012-999
6	Alternator rotor	73-21-08-01-080	IDC 001-006
		73-21-08-01-085	IDC 001-006
		73-21-08-01A-080	IDC 007-010, 012-999
		73-21-08-01A-085	IDC 007-010, 012-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. EEC Alternator and Alternator Rotor Installation

SUBTASK 73-21-08-420-001-F00

(1) Do these steps to install the EEC alternator [1]:

(a) Remove the protective covers from the alternator rotor [6], EEC alternator [1], handcranking drive pad, and end of the AGB gearshaft [7].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Apply oil, D00599 [CP2442], to the threads of the AGB gearshaft [7].

(c) Install a 3/4-inch drive tool into the handcranking drive.

1) Use the 3/4-inch drive tool to prevent the rotation of the AGB gearshaft [7].

CAUTION DO NOT USE PRE AND POST SERVICE BULLETIN ROTORS AND STATORS TOGETHER. DAMAGE TO THE ENGINE CAN OCCUR.

(d) Install the alternator rotor [6] on the AGB gearshaft [7].

NOTE: PRE-CFM-SB 73–0134 and POST-CFM-SB 73–0134 rotors and stators are not interchangeable.

(e) Install a new self-locking nut [4] on to the AGB gearshaft [7].

1) Tighten the self-locking nut [4] to 315 in-lb (36 N·m) - 345 in-lb (39 N·m).

(f) Remove the 3/4-inch drive tool from the handcranking drive.

(g) Do this task: Handcranking Drive Cover Installation, TASK 72-63-01-400-801-F00.

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(h) Lubricate the new O-ring [5] with oil, D00623 [CP5066].

(i) Install the O-ring [5] on the EEC alternator [1].

CAUTION MAKE SURE THAT YOU USE THE GUIDE PINS. IF YOU DO NOT USE THE GUIDE PINS TO REMOVE OR INSTALL THE ALTERNATOR, DAMAGE TO THE ROTOR AND THE STATOR OF THE ALTERNATOR CAN OCCUR.

(j) Install the A.C. generator stator guide pins, SPL-8025, into the bolt holes of the AGB pad.

NOTE: If the guide pins are not available, you can make the guide pins from 0.25 in. (6.35 mm) diameter steel stock that is approximately 4 in. (101.6 mm) long. Put 1/4-28 threads on one end.

CAUTION DO NOT USE PRE AND POST SERVICE BULLETIN ROTORS AND STATORS TOGETHER. DAMAGE TO THE ENGINE CAN OCCUR.

(k) Install the EEC alternator [1] over the A.C. generator stator guide pins, SPL-8025, and alternator rotor [6] until the EEC alternator [1] is aligned on the AGB pad.

NOTE: PRE-CFM-SB 73–0134 and POST-CFM-SB 73–0134 rotors and stators are not interchangeable.

(l) Remove the A.C. generator stator guide pins, SPL-8025, from the AGB pad.

(m) Use the three washers [3] and bolts [2] to attach the EEC alternator [1] to the AGB pad.

1) Tighten the bolts [2] to 60 in-lb (7 N·m) - 70 in-lb (8 N·m).

(n) Connect the J7 harness connector [16] and J8 harness connector [15] to the EEC alternator [1] receptacles.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

G. Put the Airplane Back to Its Usual Condition

SUBTASK 73-21-08-860-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 73-21-08-860-003-F00

(2) For engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

SUBTASK 73-21-08-860-004-F00

(3) For engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 73-21-08-020-002-F00

(4) Remove the DO NOT OPERATE tags from the start lever and start switch.

H. EEC Alternator and Alternator Rotor Installation Test

SUBTASK 73-21-08-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

HIGH PRESSURE SHUTOFF VALVE (HPSOV) - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks.

(1) The removal of the high pressure shutoff valve (HPSOV) switch from the hydromechanical unit (HMU).

(2) The installation of the HPSOV switch in the HMU.The HPSOV is inside the HMU.

(3) It is not necessary to remove the HMU to replace the HPSOV switch.

TASK 73-21-09-000-801-F00

2. High Pressure Shutoff Valve (HPSOV) Switch Removal

A. General

(1) The HPSOV switch is part of the kits, PN 352873-K or 352874-K.

(a) Refer to CFM-SB 73-067 or the applicable component manual for the HMU configuration and parts shown.

(b) The two wire HPSOV switch with part number 2688072 is installed in HMUs with part number 1853M56P08 and later.

(2) All tools and parts used during disassembly and assembly must be clean and free of contamination, magnetism, and visual damage.

(a) Examine installed components and tools for contamination and visual damage after the component installation into HMU.

(b) Replace damaged tools.

(c) Do not use magnetic tools.

(3) Protect components ready for assembly against contamination. Keep them in clean plastic bags or protective containers.

(a) If assembly procedures are interrupted, protect components. Protect them with clean plastic sheets or clean lint-free drop cloth.

(4) Use personal protective equipment, such as safety glasses, to protect against flying debris and extreme heat and/or cold.

(a) Supply more illumination and do procedures in a safe, controlled work environment.

(b) Do this procedure in an aircraft hangar if inclement weather is experienced.

(5) Collect all loose parts that are removed or can fall out during disassembly and assembly of the HPSOV switch assembly.

(6) As parts are removed, look for damage of the HMU components.

(7) Remove and replace HMU components that are damaged or contaminated.

(8) Foreign object debris/foreign object damage (FOD) refers to a object/particle that does not belong in the natural or design state of a part, process, or environment.

(a) Foreign object debris can be generated during maintenance of the HMU and/or its components.

(b) Foreign object debris can cause foreign object damage. The extent of damage can range from minute defects in components to loss of life.

(c) All persons in contact with the HMU and its components must be responsible to prevent FOD.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(d) Some potential FOD materials are, but not limited to, old safety cables, old safety cable ferrules, lock wire, aluminum seals, cable ties, new part packaging, and parts kit packaging materials.

(9) Do not use parts that do not meet running torque requirements or show visual damage.

(a) Replace parts that are lost, out of tolerance, or damaged

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-21-09-860-002-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

SUBTASK 73-21-09-860-003-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND

SUBTASK 73-21-09-860-001-F00

(3) Make sure the engine start lever is in the CUTOFF position.

(a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 73-21-09-010-001-F00

(4) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 73-21-09-210-001-F00

(5) Make sure that the HMU is clean before you remove the connector cover (Figure 201)

NOTE: The HPSOV switch is very sensitive to all contamination. The electrical cover and wire connector areas must be free of possible contamination.

(a) Clean the possible contamination from the HMU connector cover and all electrical connector areas.

(b) If it is necessary, clean applicable HMU surfaces with a clean, lint-free cloth.

E. Procedure

SUBTASK 73-21-09-010-002-F00

(1) Do these steps to remove the electrical connector cover from the HMU(Figure 201) :

(a) Remove the safety cable and ferrule, or optional lockwire and seal, on the electrical connector cover.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Remove the connector cover, screws, and washers from the HMU.

(c) Keep the drilled head screws; used for lockwire, separate from the solid head screws.

(d) Put loose parts in clean plastic bags or containers for later use.

(e) Discard all disconnected and/or missing cable ties from the HMU connector cover cavity.

(f) Examine all wire bundles for loose cable ties, cut lead wires in connector lead wire interface area, overspeed governor (OSG) reed switch assembly damaged insulation, cut pinched, smashed, and/or chaffed wires.

NOTE: Do not try repair electrical wires. Engine damage could occur.

1) Make sure that the internal lead wires are not damaged in connector lead wire interface area.

a) Reject the HMU if any exposed primary lead wire is shown, to prevent a possible short-to-ground condition.

2) External damage to outer OSG switch insulation and wire shielding is permitted.

3) Broken OSG switch shielding wires are not permitted.

NOTE: There is an unconnected green wire with a contact pin bundled inside of the main wire bundle. This wire is not intended to be connected to any connector or electrical component. The appearance of this unconnected, bundled wire is normal.

SUBTASK 73-21-09-030-001-F00

(2) HMU WITHOUT WIRE RETENTION;

Do these steps to remove the cable ties and examine the wire bundles (Figure 203)

(a) Find the cable ties and make sure it is the cable tie(s) that bundle the HPSOV switch wires with the other wires.

(b) Carefully cut the cable ties at the locking feature and remove cable tie(s).

NOTE: Be careful not to damage wires under the cable ties when you remove the cable ties.

1) Make sure that all cut cable tie(s) are collected and discarded.

NOTE: If the removed cable ties contaminate area, stop all work. Find and remove all FOD.

(c) Examine the wire bundles where the cable ties were removed as follows:

1) Look for the damage of insulation, OSG switch assembly, insulated braided shield or solder shield termination,.

2) Look for wires that are cut, pinched, smashed, and/or chaffed.

3) If the wires are damaged, replace all damaged components.

SUBTASK 73-21-09-030-002-F00

(3) HMU WITH WIRE RETENTION;

Do these steps to remove the cable ties and examine the wire bundles (Figure 202,Figure 203):

(a) Examine the HMU connector cover cavity for disconnected and/or missing cable ties.

1) Note the location of disconnected and/or missing cable ties.

2) Collect all disconnected cable ties and discard.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Carefully cut the cable ties at the locking feature and remove the cable tie(s).

NOTE: Be careful not to damage wires under the cable ties when you remove the cable ties.

4) Carefully remove all of the cable tie pieces around the Teflon chafing sleeve of the wire bundle for the channel B connector.

(b) Examine the wire bundles where the cable ties were removed as follows:

1) Look for the damage of insulation, OSG switch assembly, insulated braided shield or solder shield termination,.

2) Look for wires that are cut, pinched, smashed, and/or chaffed.

3) If the HMU wires are damaged, reject the HMU.

SUBTASK 73-21-09-030-003-F00

(4) Do these steps to disconnect the HPSOV switch [1] from the HPSOV indicator connector:

(a) Find the HPSOV switch wires and separate them from the other wires.

(b) Remove the engine connector DP1207. Use connector cable pliers.

(c) Remove the hex socket head cap screws from the HPSOV indicator connector.

NOTE: The use of silicone grease on the end of hex tool will work as a mastic to aid in removal of the hex socket head cap screw.

(d) Put the loose parts in a clean plastic bag or container for later use.

(e) Lightly pull the HPSOV indicator connector away from HMU.

SUBTASK 73-21-09-020-001-F00

(5) Do these steps to remove HPSOV switch [1] from the HMU:

NOTE: Shims are used with the three wire switch, PN 2680287, Shims are not used with the two wire switch, PN 2688072.

(a) Remove the screws and washers from the HPSOV switch assembly and put in a clean plastic bag for later use.

NOTE: Use care not to drop small parts during disassembly. If removed screws, washers, and shims contaminate area, stop all work. Find and remove all FOD.

NOTE: Do not use magnetic tools to remove the HPSOV switch parts. Damage to the HPSOV could occur.

(b) Remove the HPSOV switch assembly from HMU cavity: The switch assembly should come out of the HMU cavity freely, under its own weight.

(c) If the switch assembly cannot be removed freely from HMU, reject the HMU.

(d) THREE WIRE HPSOV SWITCH;

If the switch shims stay in the HMU body cavity, remove the shims.

NOTE: Shims are used with the three wire switch, PN 2680287, Shims are not used with the two wire switch, PN 2688072.

1) If petrolatum was used on the shims to help hold them in place, the shims can remain attached to the switch cavity in the HMU body or on the mating side of the switch.

2) Use a ball-end dental-type explorer tool, or equivalent.

(e) If it is necessary, remove the guide pins and examine the HMU body cavity for contamination before installing switch components.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) If contamination is found, clean the HMU body cavity with clean, lint-free wipes until all contaminants are removed.

NOTE: Be careful not to introduce contamination when you clean the switch cavity. The exposed HMU body cavity is sensitive to contamination.

(g) Remove the contact pins and wires from the connector back shell.

(h) Examine the sealing grommet and preformed packing on the mating side of connector as follow:

1) Look for cuts and other possible damage caused during pin removal.

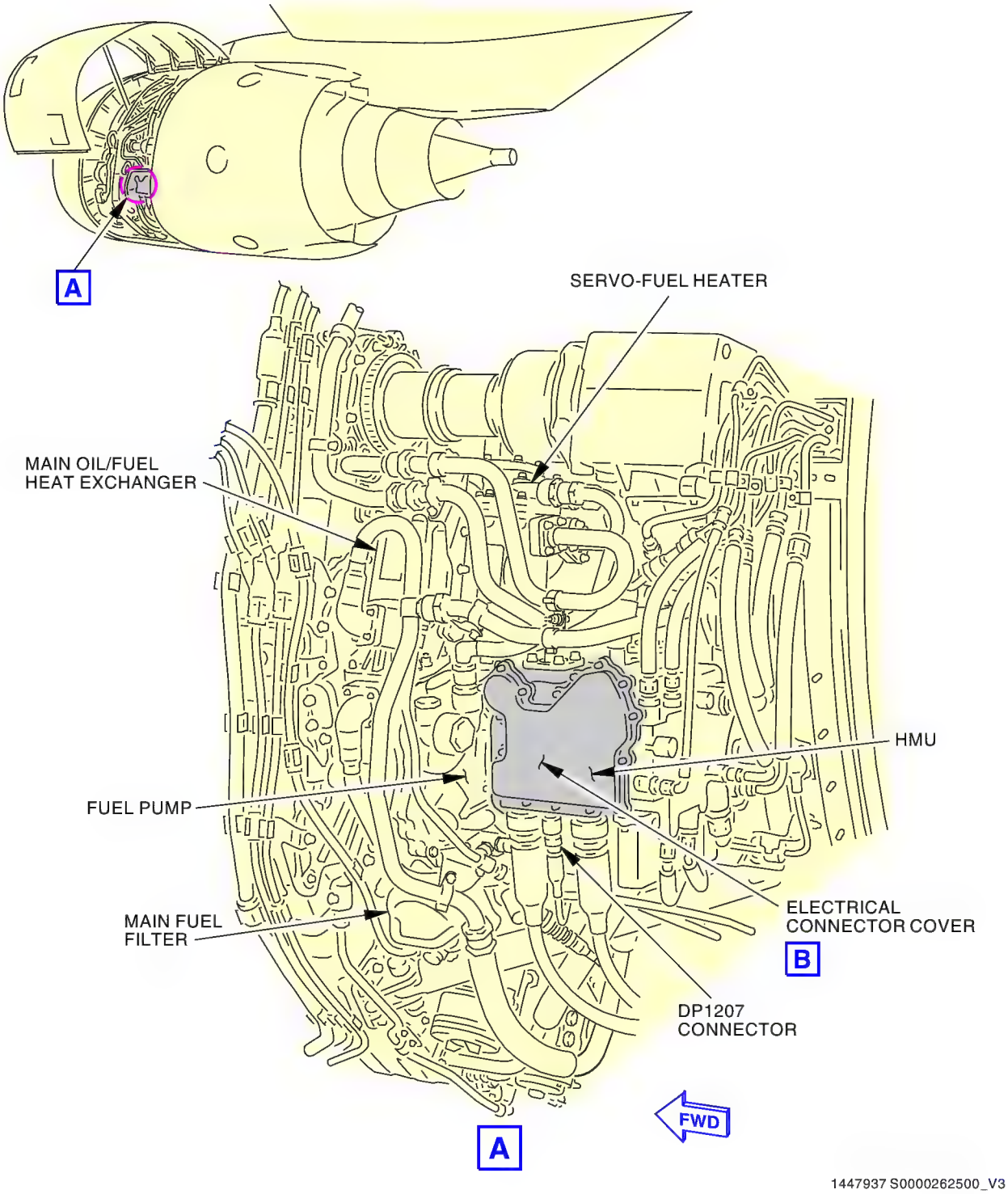
2) If the grommet or preformed packing is damaged, replace them.

3) If the connector passes inspection, put the connector in a clean plastic bag.

(i) Pull loose the HPSOV switch wires from the HMU body cavity.

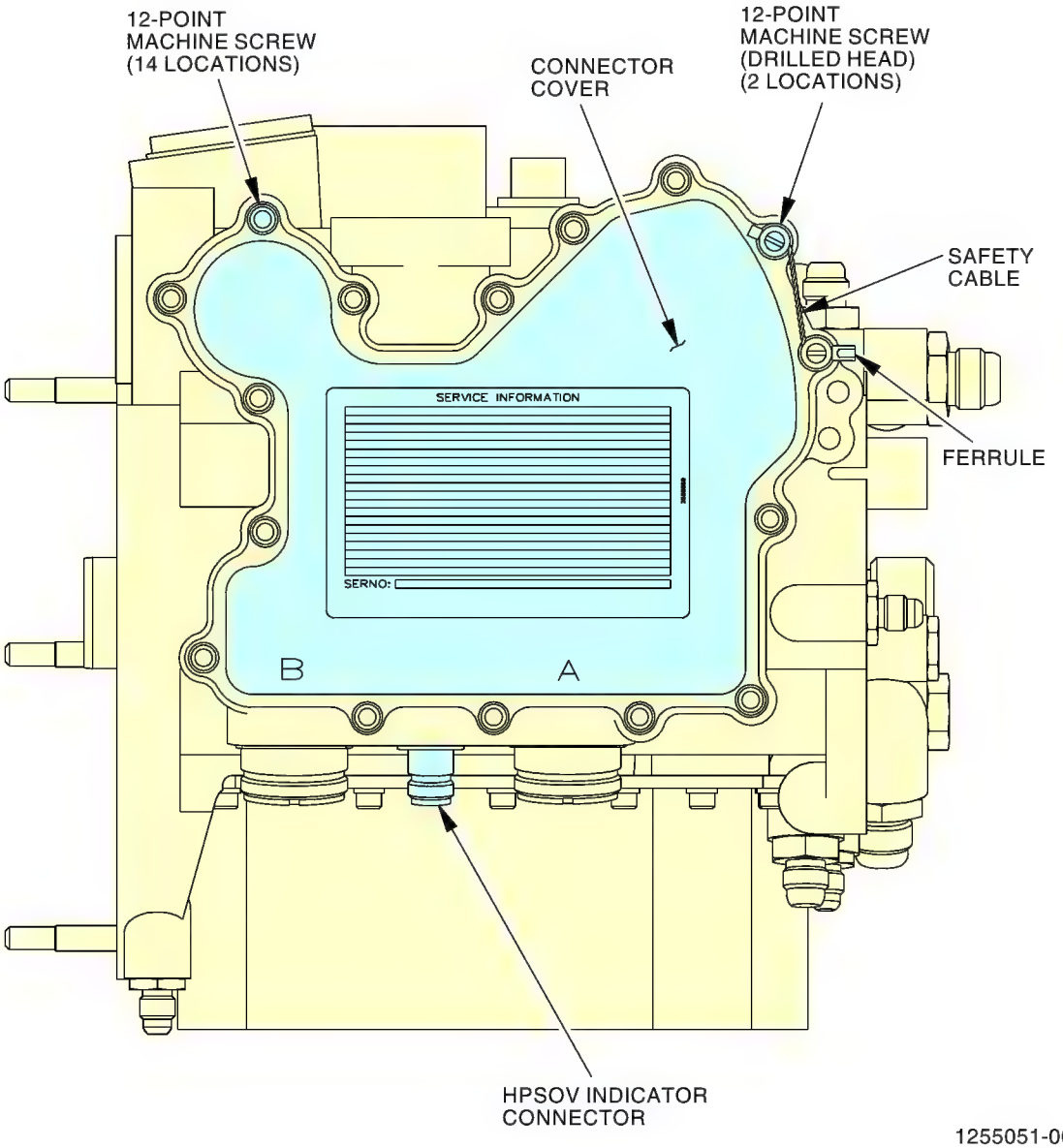
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



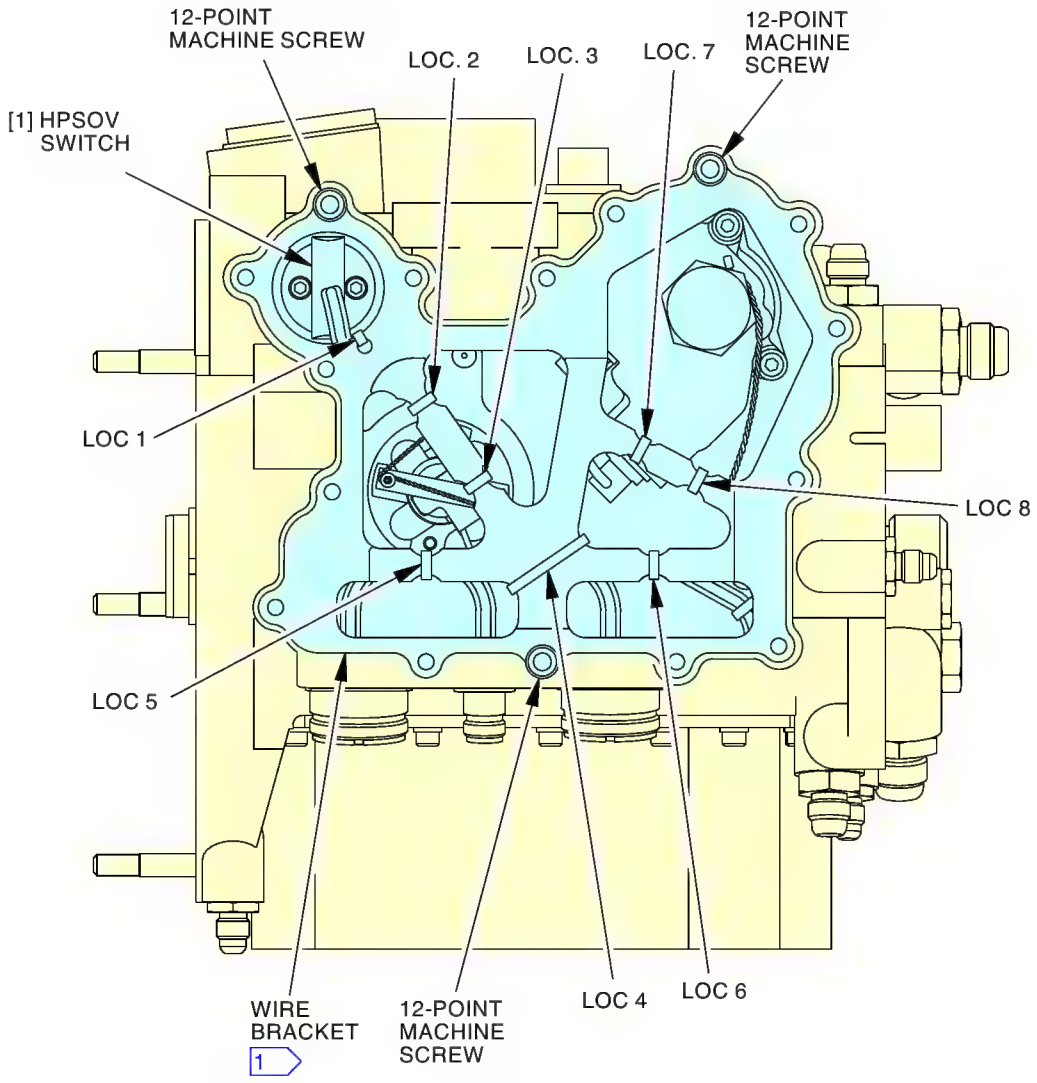
HMU Connector Cover
Figure 201/73-21-09-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



HMU Connector Cover
Figure 201/73-21-09-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



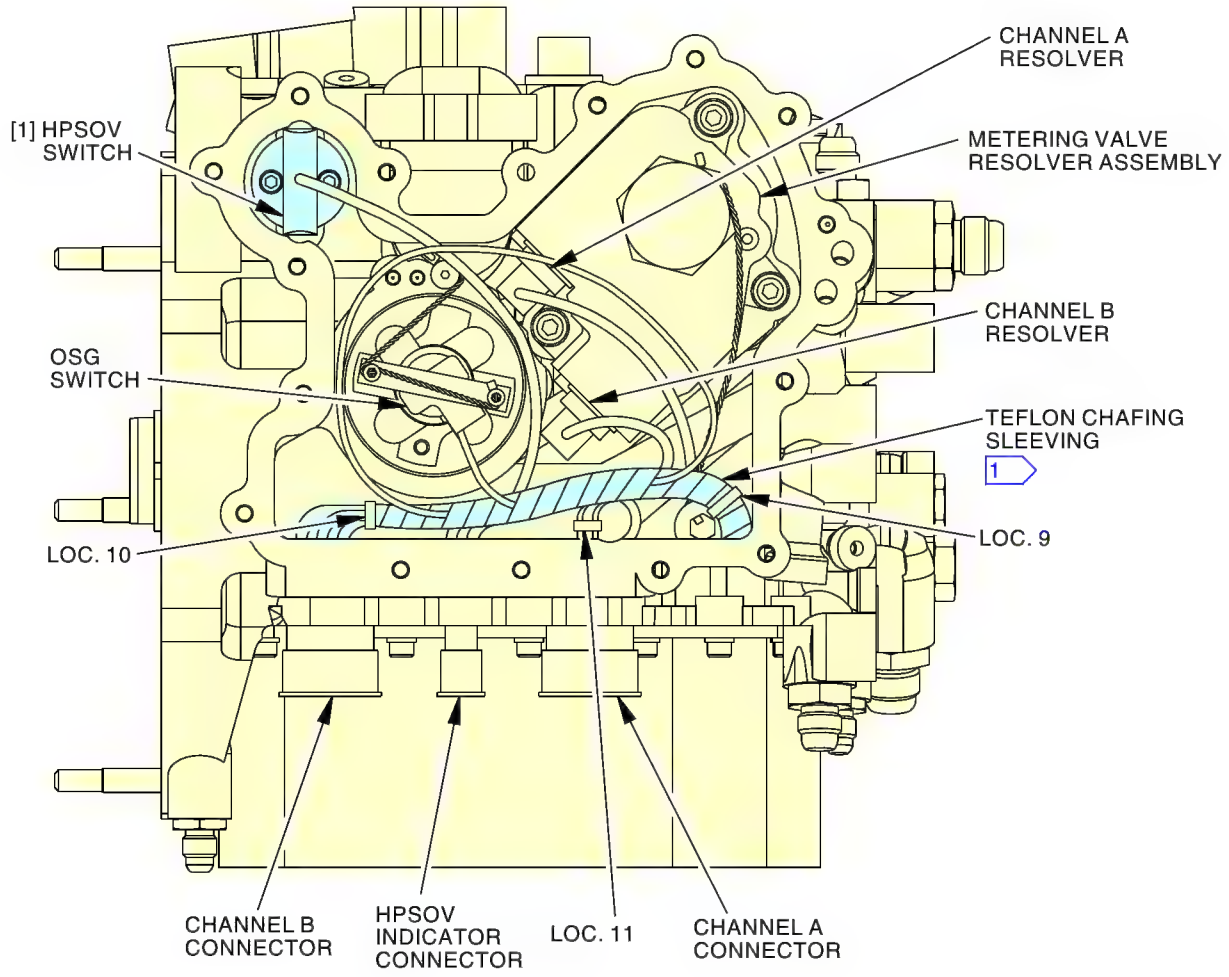
1 HMU WITH WIRE RETENTION

1255052-00-B

1447739 S0000262503_V2

HPSOV Switch and Bracket Cable Tie Location
Figure 202/73-21-09-990-802-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



1 HMU WITH WIRE RETENTION

1255053-00-B
1447771 S0000262502_V2

HPSOV Switch and Connector Cavity Cable Tie Location
Figure 203/73-21-09-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-09-400-801-F00

3. High Pressure Shutoff Valve (HPSOV) Switch Installation

A. General

(1) The HPSOV switch is part of the kits PN 352873-K or PN 352874-K.

(a) Refer to CFM-SB 73-067 or the applicable component manual for the HMU configuration and parts shown.

(b) The two wire HPSOV switch with part number 2688072 is installed in HMUs with GE part number 1853M56P08 and later.

(c) This task installs the two wire HPSOV switch.

B. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Procedure

SUBTASK 73-21-09-210-002-F00

(1) Do these steps to examine the new HPSOV switch assembly:

(a) Examine the HPSOV switch assembly for a loose, staked, cover (where the SN is marked).

1) If the switch cover is loose, reject the HPSOV switch assembly.

2) Get a new HPSOV switch assembly and examine for a loose cover.

(b) Examine the connector contact pins and sockets on all wires for visible indications of bending and other damage.

NOTE: It is not permitted for you to repair electrical wires

1) If the contact pins, sockets, or wires are damaged, reject the HPSOV switch.

2) Use a new HPSOV switch assembly.

SUBTASK 73-21-09-420-001-F00

(2) Do these steps to install the HPSOV switch assembly [1]:

NOTE: There is an unconnected green wire with a contact pin bundled inside of the main wire bundle. This wire is not intended to be connected to any connector or electrical component. The appearance of this unconnected, bundled wire is normal.

(a) Carefully thread the switch wires behind the main wire bundle, away from the over speed governor (OSG) switch safety cable, and through the electrical connector hole in the HMU body.

(b) Do these steps to install the wires of the new HPSOV switch in the electrical connector (Figure 205):

NOTE: Do not spread tip, or rotate connector contact insert-extract tool in the electrical connector to avoid damage to the connector and tool,

NOTE: If it is necessary, use the plastic contact insert-extract tool M81969/14-11 or equivalent.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Install the contact pin and wire in the insert-extract tool.
2) Push the contact pin firmly into seated position in the proper numbered hole in backside of connector.
3) Release the wire and remove insert-extract tool. Make sure that the pin is locked in the connector.
4) Do the above steps again to install the second wire.
5) If it is necessary, insert a blank contact pin PN M39029/4-110 and end seal plug PN MS27488-20 in the HPSOV indicator connector for pin 2.

(c) Do these steps to install the HPSOV indicator connector on the HMU body(Figure 206)

1) Put the HPSOV indicator connector on the HMU body with the master keyway as shown
2) Tuck the slack connector wire into the HMU body.

   NOTE: Avoid the overspeed governor safety cable and sharp corners that can cause possible chafing of the wire insulation.

3) Seat the connector on the HMU body in position as shown.

   NOTE: Make sure that no wires are trapped between the connector and the HMU body

4) Make sure that the switch wires exit the switch housing face outward towards operator.
5) Install the four hex socket head cap screws.
   a) Torque screws 4.0-4.5 lb in. (0.45-0.50 N.m) above observed running torque 1.0-5.0 lb in. (0.11-0.56 N.m).
   b) Use a drive wrench extension, and a 0-25 lb in. (0-2.83 N.m) torque wrench.

(d) Do these steps to install the HPSOV switch [1] in the HMU cavity

1) Look for the locating-rib on the right side of the HPSOV switch.
   a) Make sure the locating-rib engages the notch in the mounting switch cavity.
2) Install one screw and washer into switch mounting hole as follows:
   a) Use a thin film of petrolatum or silicon grease applied to the washer to act as a mastic to hold the washer and screw together. Put the washer over the screw.
   b) Use a thin film of petrolatum or silicon grease applied to the hex end of the screw to act as a mastic to hold the screw and hex tool together. Insert the hex tool into the head of screw.
3) Install the HPSOV switch assembly into the slot in HMU body cavity.

   NOTE: Do not use force to install the switch assembly into HMU cavity.

   NOTE: For the switch to operate properly, the wires that exit the reed switch assembly must face outward toward the operator when you install the switch in the HMU cavity

4) The HPSOV switch assembly should install freely, under its own weight, into the HMU body cavity.
   a) If the switch assembly does not install freely, reject the HMU.
5) Do these steps to fully seat the switch body in the slotted seat of the HMU body.
   a) Make sure that the switch wires that exit the switch housing face outward towards the operator.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

b) Tighten the installed screw to hold the switch assembly in place.

c) Install the remaining washer and screw.

d) Torque the two screws 4.0-4.5 lb-in. (0.45-0.50 Nm) above observed running torque 1.0-5.0 lb-in. (0.11-0.56 Nm).

e) Use a drive wrench extension, and a 0-25 lb-in. (0-2.83 Nm) torque wrench.

SUBTASK 73-21-09-760-001-F00

(3) Do a continuity and resistance check on the HPSOV connector wire connections with a digital multi-meter

(a) Compare the meter readout to the continuity and resistance check values (Figure 207)

HPSOV CONNECTOR CONTINUITY CHECK	
CONNECTOR PIN	**CONTINUITY**
1-2	OPEN
2-3	OPEN

1) If a test point is not satisfactory, examine the wire-to-connector pins(Figure 207)

2) If the connector pins are correct, remove and replace the HPSOV switch assembly.

SUBTASK 73-21-09-430-001-F00

(4) HMU WITHOUT WIRE RETENTION

Do these steps to bundle and secure the HPSOV switch wires:

(a) Do these steps to install new, self-locking cable ties.

1) Use a cable tie Panduit installation tool GS2B or equivalent at intermediate setting with tension set at three (3) in the handle.

NOTE: Stretched cable ties that snap apart instead of being cut cause an unknown restraint condition of the cable tie. A cable tie can become separated and result in a loose wire bundle and cable tie. A loose cable tie can contaminate the HMU and create a FOD condition.

2) Examine the Panduit installation tool for proper function of cutting element. If cutting element does not work properly to cut the cable tie, repair or replace the too

(b) Bundle and secure channel A and the switch wire harness with a new cable tie.

NOTE: Avoid the overspeed governor safety cable and sharp corners that can cause possible chafing of the wire insulation.

(c) Bundle and secure channel B and the switch wire harness with a new cable tie.

NOTE: Avoid the overspeed governor safety cable and sharp corners that can cause possible chafing of the wire insulation.

1) Make sure that a cable tie is installed over the HPSOV switch double-insulated wires and captures all of the loose wire bundles.

SUBTASK 73-21-09-430-002-F00

(5) HMU WITH WIRE RETENTION;

Do these steps to bundle and secure the switch wires:

(a) Group the OSG and HPSOV switch wires together and capture with the Teflon chafing sleeve.

1) Apply one wrap (minimum) of the Teflon chafing sleeve on opposite side of exiting OSG and HPSOV switch wires to secure the wire bundle.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

a) This will separate the switch wires for the wire bracket alignment.

(b) Put the wire bracket over the partially bundled wires.

1) Make sure that the OSG and AFSO switch wires align with the web-arm of the bracket for proper cable tie installation.

(c) Remove the wire bracket and set aside for later use.

(d) Continue to secure remainder of wire bundle with the Teflon chafing sleeve.

(e) Make sure that all wires have been captured with the Teflon chafing sleeve and routed away from the safety cable/safety wire.

NOTE: Avoid the overspeed governor safety cable and sharp corners that can cause possible chafing of the wire insulation.

(f) Install a new, self-locking cable tie PN 2675459-21 over the Teflon sleeve in the approximate location as the previously removed cable tie.

NOTE: Avoid the overspeed governor safety cable and sharp corners that can cause possible chafing of the wire insulation.

(g) Do these steps to install the Wire bracket cable ties:

1) Secure the wire bracket in place over the connector cavity with the three 12-point machine screws Figure 202.

NOTE: Make sure that no wires are trapped between the connector and the HMU body

a) Secure the screws finger tight.

(h) Install new cable ties on the wire bracket.

NOTE: Electrical wires can be damaged by sharp edges. Chafed, cut, or nicked wires can make the part unserviceable. Position the wire bundles to prevent contact with HMU components.

1) Put the cable ties in the bracket concaves to prevent wire bundle movement.

2) Put the locking device of the cable ties below the top surface of the bracket to prevent interference with the connector cover installation.

3) Install the wire bracket cable ties at the eight locations.

SUBTASK 73-21-09-430-003-F00

(6) HMU WITHOUT WIRE RETENTION;

Do these steps to install the connector cover (Figure 201):

(a) Examine the connector cover and mating HMU flanges for general cleanliness. If it is necessary, clean the mating surfaces before you install the cover.

(b) Do these steps to install the connector cover and screws:

1) Put the connector cover over the HMU and install the two drilled-head screws, used for lockwire, in the two locations.

NOTE: Do not permit electrical wires to be pinched between the connector cover and the HMU connector cover mounting surface. Nicks and/or cuts to the electrical wires can result from contact with sharp edges of the cover and HMU surfaces.

2) Install the remaining screws into the cover. Start at the top-most drilled head screw, and in a clockwise direction, run all screws down to one-half turn from bottoming out.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Torque all screws in the same order and direction (as installed) to 10-15 lb in. (1.13-1.70 N.m) over running torque 1.5-10 lb in. (0.17-1.13 N.m).

a) Use a drive wrench extension, and a 0-25 lb-in. (0-2.83 Nm) torque wrench.

SUBTASK 73-21-09-410-001-F00

(7) HMU WITH WIRE RETENTION

Do these steps to install the connector cover (Figure 201):

(a) Remove the three 12-point machine screws from the wire bracket and set aside for later use.

(b) Examine the connector cover and mating HMU flanges for general cleanliness. If it is necessary, clean the mating surfaces before you install the cover.

(c) Put the connector cover over the wire bracket and install the two 12-point machine drilled-head screws in the two locations

NOTE: Do not permit electrical wires to be pinched between the connector cover and the HMU connector cover mounting surface. Nicks and/or cuts to the electrical wires can result from contact with sharp edges of the cover and HMU surfaces.

1) Tighten the two screws finger tight.

2) Install the remaining screws into the cover. Start at the top-most drilled head screw, and in a clockwise direction, run all screws down to one-half turn from bottoming out.

3) Torque all screws in the same order and direction (as installed) to 10-15 lb in. (1.13-1.70 N.m) over running torque 1.5-10 lb in. (0.17-1.13 N.m).

a) Use a drive wrench extension, and a 0-25 lb-in. (0-2.83 Nm) torque wrench

SUBTASK 73-21-09-430-004-F00

(8) Install the engine connector DP1207 connector to the HMU until the full insertion line is hidden.

(a) Use connector cable pliers to tighten the mating connector.

SUBTASK 73-21-09-430-005-F00

(9) Do these steps to secure the HMU connector cover.

(a) If die-letter designations are used, mark on the fixed-ferrule end of the safety cable.

(b) Install new safety cable and safety cable ferrule drilled-head machine screws.

(c) Use safety cable crimp tool PN SCTR327 to crimp ferrule on cable.

(d) Fully close the tool handle to properly tighten the cable, crimp the ferrule, and cut off the excess safety cable.

(e) Release the handle of the crimp tool and remove the excess safety cable from crimp tool.

NOTE: A cut safety cable can contaminate the HMU. Stop all work. Find and remove FOD.

(f) Discard the excess safety cable.

(g) Examine the cable and ferrule to make sure it is secure, has proper pull on screws, and is not damaged.

SUBTASK 73-21-09-800-001-F00

(10) Do these steps to mark the identification plate when the HPSOV switch is replaced:

(a) The HMU identification plates are black or yellow. Black identification plates indicate original equipment manufacturer (OEM). Yellow identification plates indicate previously serviced equipment.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) If the identification plate has a letter K stamped on it or a serial number of 1285 or higher, do not remove or mark the identification plate.

NOTE: Some HMU units may already have identification plates previously stamped with a K . It is not necessary to remove and mark these plates.

NOTE: Some HMU units have a serial number of 1285 or higher and do not have a K marked on them. It is not necessary to remove and mark these plates.

(c) If you replace a two wire HPSOV switch with a two wire switch, no action is necessary.

(d) If you replace a three wire HPSOV switch with a two wire switch, refer to CFM SB 73-067.

E. HPSOV Switch Installation Test

SUBTASK 73-21-09-840-001-F00

(1) Put the airplane in a serviceable condition:

(a) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(b) Remove the DO-NOT-OPERATE tag from the applicable start lever.

(c) For Engine 1, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

(d) For Engine 2, remove the safety tags and close these circuit breakers:

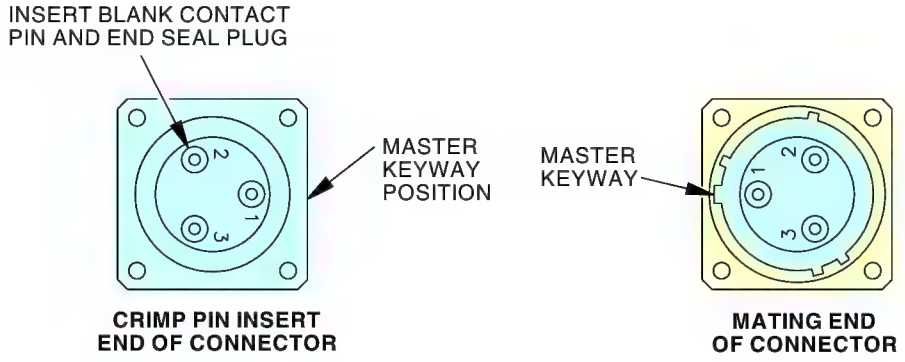
F/O Electrical System Panel, P6-3

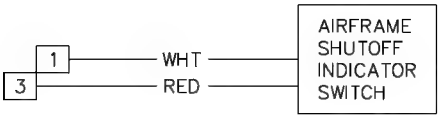
Row	Col	Number	Name
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND

(e) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



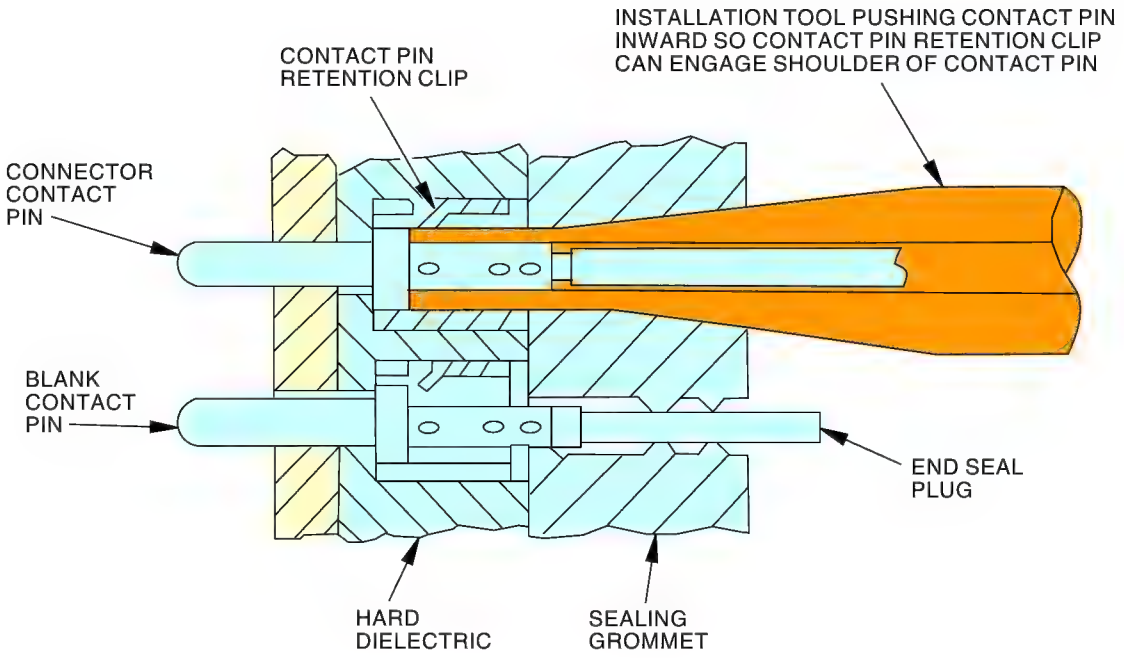


1255054-00-B

1447802 S0000262504_V2

HPSOV Switch Connector Diagram
Figure 204/73-21-09-990-804-F00

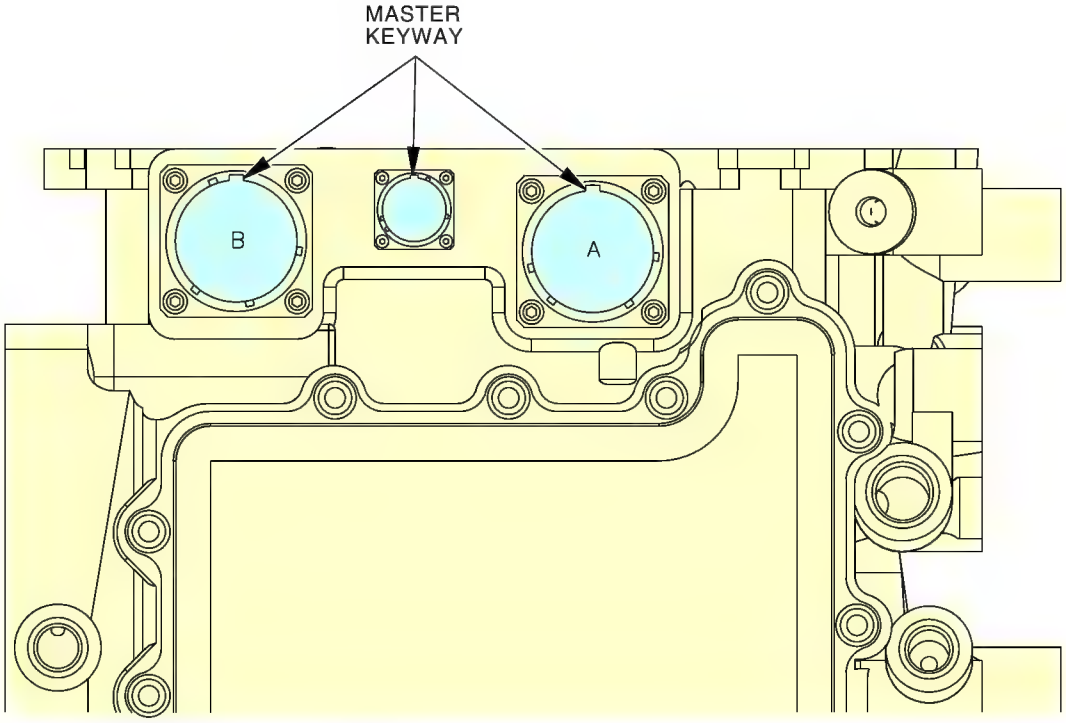
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



1255055-00-B
1447852 S0000262515_V2

Contact Pin And End Seal Plug in Connector Grommet
Figure 205/73-21-09-990-805-F00

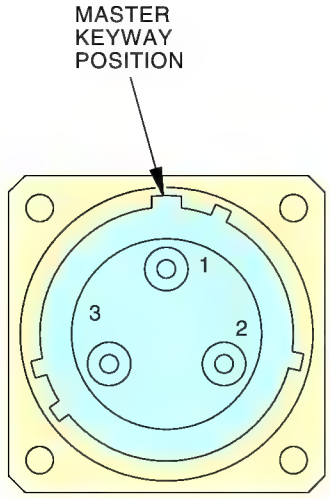
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



1255056-00-B
1447868 S0000262516_V2

Electrical Connector Master Keyway Location
Figure 206/73-21-09-990-806-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



MATING END OF CONNECTOR

CFM56222

	Resistance	
	Low Limit	High Limit
1-3	0.0 ohm	0.5 ohm
2-Case(GND)	500 Kohms	Infinite
3-Case(GND)	500 Kohms	Infinite

1255057-00-B
1447713 S0000262518_V2

HPSOV Connector Check
Figure 207/73-21-09-990-807-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

HYDROMECHANICAL UNIT - MAINTENANCE PRACTICES

1. General

A. This procedure has the task to examine the hydromechanical unit (HMU).

73-CMR-01

TASK 73-21-10-200-801-F00

2. HMU Inspection

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task includes the steps to examine (Internal) the HMU.

(2) The HMU is connected to the fuel pump assembly on the aft side of the accessory gearbox.

B. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

C. Procedure

SUBTASK 73-21-10-210-008-F00

(1) If a HMU part number 1853M56P04 or 1853M56P05 is installed, refer to CFM SB 73-016.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

HYDROMECHANICAL UNIT - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the hydromechanical unit (HMU)

(2) The installation of the hydromechanical unit (HMU).

(a) You can install a new high pressure shutoff valve (HPSOV) switch without removing the HMU.

1) Refer to CFM-SB 73-067.

2) or refer to HIGH PRESSURE SHUTOFF VALVE (HPSOV) - MAINTENANCE PRACTICES, PAGEBLOCK 73-21-09/201.

TASK 73-21-10-000-801-F00

2. HMU Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) The HMU is connected to the fuel pump assembly that is at the 8:00 o'clock position on the aft side of the accessory gearbox.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2358	Set - Adapter, Torque Hydromechanical UN & MN Fuel Pump Nuts Part #: 856A1827G01 Supplier: 58828
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G00624	Bag - Plastic, General Purpose	
G00920	Tape - Waterproof, Packaging	ASTM D5486
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Plug	73-11-01-01-060	IDC 001-006
		73-11-01-01A-110	IDC 007-010, 012-999
3	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Removal

SUBTASK 73-21-10-840-001-F00

(1) Do these steps to isolate the fuel system:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure the engine start lever is in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

(c) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition; 2) dim when the valve is closed or 3) off when the valve is opened.

(d) Make sure the SPAR VALVE CLOSED light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the spar shutoff valve has three positions: 1) bright when the valve is in transition; 2) dim when the valve is closed or 3) off when the valve is opened.

(e) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

NOTE: The removal of the electrical power is necessary while you disconnect the electrical and fluid connectors. You can reapply electrical power to the airplane after all of the electrical and fluid connectors are disconnected and the protective covers are installed.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

(f) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 73-21-10-680-002-F00

(2) Do these steps to drain the fuel from the fuel pump:

WARNING DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054 below the fuel pump.

(b) Remove the drain plug [2] from the fuel filter cover.

(c) Let the fuel drain in the container.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(d) Remove and discard the O-ring [3] from the drain plug [2].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(e) Lubricate a new O-ring [3] with oil, D00623 [CP5066].

(f) Install a new O-ring [3] the drain plug [2].

(g) Lubricate the threads of the drain plug [2] with oil, D00623 [CP5066].

(h) Install the drain plug [2].

1) Tighten the drain plug [2] to a torque of 45-55 pound-inches (5.0-6.2 Newton meters).

(i) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the drain plug [2].

H. Remove the HMU

SUBTASK 73-21-10-020-001-F00

(1) Disconnect these electrical connectors from the HMU [1]:

NOTE: If it is necessary, you can use soft-nose connector pliers to loosen the coupling nuts on the connectors.

(a) The DP1203 (MW0312) connector

(b) The DP0501 (J5) connector

(c) The DP1207 (MW0312) connector

(d) The DP0601 (J6) connector

(e) The DP0803 (J8) connector on the fuel filter differential pressure switch.

(f) Install protective covers on the plugs and the receptacles.

1) Move the electrical connectors out of the way, to make sure that they are not damaged.

a) If it is necessary, use lockwire or tape to keep the connectors out of the way.

SUBTASK 73-21-10-210-001-F00

(2) Make sure that the container stays below the HMU during the removal procedure.

(a) As you disassemble the fuel system, let the unwanted fluids drain into the container.

SUBTASK 73-21-10-010-001-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(3) Disconnect the hoses from the HMU [1]:

(a) Use two wrenches to disconnect these hoses:

NOTE: The hoses are arranged so that the same wrenches can be used at the same time.

1) The LPT hose [4]

2) The HPT hose [5]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL PRE SB CFM56-7B 73-44

3) The BSV hose [10]

NOTE: Engines POST CFMI SB 73-044 do not have the BSV hose [10] installed.

IDC ALL

4) The TBV hose [12].

(b) Use two wrenches to disconnect these hoses:

1) The VSV hose (ROD) [6]

2) The VBV hose (CLOSED) [8]

3) The PCR hose [11].

(c) Use two wrenches to disconnect these hoses:

1) The VSV hose (HEAD) [7]

2) The VBV hose (OPEN) [9].

(d) Install protective covers on the hoses and the HMU.

1) If it is necessary, use lockwire or tape to keep the hoses out of the way.

SUBTASK 73-21-10-020-007-F00

CAUTION USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(4) Do these steps to remove the fuel tube [17] from the HMU [1]:

(a) Use two wrenches to disconnect fuel tube [17] from fuel tube [19].

(b) Remove the four bolts [16] that hold the fuel tube [17] and the gasket [18] to the HMU [1].

NOTE: To aid in the removal of the four bolts [16], a 20 inch (50 cm) extension can be used to remove the two inboard bolts. A 2 inch (5 cm) deep-well socket can be used to remove the two outboard bolts.

(c) Remove the nut [21], bolt [22] and the clamp [20] that hold the fuel tube [17] to the bracket.

NOTE: The nut [21] and the bolt [22] also hold a clamp for the oil tube [15].

1) Let the additional clamp stay on the oil tube [15].

(d) Remove the nut [23], bolt [24], and clamp [25] that hold the fuel tube [17] to the bracket.

(e) Remove the fuel tube [17].

1) If the gasket [18] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to this task (TASK 70-30-01-910-802-F00) for gasket and seal maintenance practices.

(f) Install protective covers on the fuel tube [17], fuel tube [19] and the HMU [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-10-030-001-F00

CAUTION: USE TWO WRENCHES WHEN YOU LOOSEN OR TIGHTEN THE CONNECTION. ONE WRENCH WILL HOLD ONE SIDE OF THE CONNECTION IN ITS POSITION. ONE WRENCH WILL TURN THE OTHER SIDE OF THE CONNECTION. IF YOU DO NOT OBEY THIS TWO-WRENCH PROCEDURE, YOU CAN CAUSE DAMAGE TO THE CONNECTION COMPONENTS.

(5) Do these steps to remove the fuel tube [43] from the servo-fuel heater inlet port.

(a) Use two wrenches to disconnect the fuel tube [43] from the servo-fuel heater inlet port.

(b) Use two wrenches to disconnect the fuel tube [43] from the fuel pump.

(c) Install protective covers on the fuel tube [43], servo-fuel heater and fuel pump.

SUBTASK 73-21-10-020-008-F00

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(6) Do these steps to remove the fuel tube [39] from the HMU and the servo-fuel heater:

(a) Use two wrenches to disconnect the fuel tube [39] from the servo-fuel heater.

(b) Remove the four bolts [27] that hold the fuel tube [39] and the gasket [26] to the HMU [1].

(c) Remove fuel tube [39].

1) If the gasket [26] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to this task (TASK 70-30-01-910-802-F00) for gasket and seal maintenance practices.

(d) Install protective covers on the fuel tube [39], servo-fuel heater, and HMU.

SUBTASK 73-21-10-020-009-F00

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(7) Do these steps to remove the fuel tube [33] from the HMU [1]:

(a) Use two wrenches to disconnect fuel tube [33] from fuel tube [38].

(b) Remove the four bolts [32] that hold the fuel tube [33] and the gasket [34] to the HMU [1].

(c) Remove the nut [35], bolt [36], and clamp [37] that hold the fuel tube [33] to the bracket.

1) If it is difficult to remove fuel tube [33], loosen the clamps that hold the fuel tube [38] to the bracket that is above the fuel pump package.

NOTE: This will permit you to move fuel tube [38] and can make it easier to remove the fuel tube [33].

(d) Remove fuel tube [33].

1) If the gasket [34] is serviceable, then keep it with the tube for the subsequent installation.

NOTE: Refer to this task (TASK 70-30-01-910-802-F00) for gasket and seal maintenance practices.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(e) Install protective covers on the fuel tube [33], the fuel tube [38], and the HMU.

SUBTASK 73-21-10-020-010-F00

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(8) Remove drain tube [30] and drain tube [31]:

(a) Use two wrenches to disconnect the drain tube [30] from the drain tube [29].

(b) Use two wrenches to disconnect the drain tube [30] from the bottom of the HMU.

(c) Remove the drain tube [30].

1) Install protective covers on the drain tube [30], the drain tube [29] and the HMU.

(d) Use two wrenches to disconnect the drain tube [31] from the drain tube [28].

(e) Use two wrenches to disconnect the drain tube [31] from the drain.

(f) Remove the drain tube [31].

1) Install protective covers on the drain tube [31], the drain tube [28] and the drain.

SUBTASK 73-21-10-020-005-F00

WARNING: BE CAREFUL WHEN YOU MOVE THE HMU. THE HMU WEIGHS 40 POUNDS (18 KILOGRAMS). THE WEIGHT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION: DO NOT LIFT THE HMU BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT HOLD THE WEIGHT OF THE HMU. IF THE DRIVE SHAFT HOLDS THE WEIGHT OF THE HMU, IT CAN CAUSE DAMAGE TO THE HMU SEALS.

(9) Do these steps to disconnect the HMU [1] from the fuel pump:

(a) Remove the six nuts [40] and washer [41] that hold the HMU [1] to the fuel pump.

NOTE: The three outboard studs are on the fuel pump and the three inboard studs are on the HMU.

1) Use the set, SPL-2358 to get access to the center and lower inboard studs.

NOTE: If the tool is not available, then you can insert a long extension from the forward side, between the fan case and the accessory gearbox.

(b) Remove the HMU [1].

(c) Remove the gasket [42].

1) Examine the gasket [42] for scratches, nicks, dents and cuts (TASK 70-30-01-910-802-F00).

a) If the gasket is serviceable, keep it for the subsequent installation.

b) If the gasket is not serviceable, replace it.

(d) Install protective covers on the mating surfaces of the HMU [1] and the fuel pump.

(e) To drain the fuel by gravity from the HMU, do these steps:

NOTE: The HMU cannot be shipped with hazardous waste (fuel) inside. The HMU cannot be flushed with oil in the field.

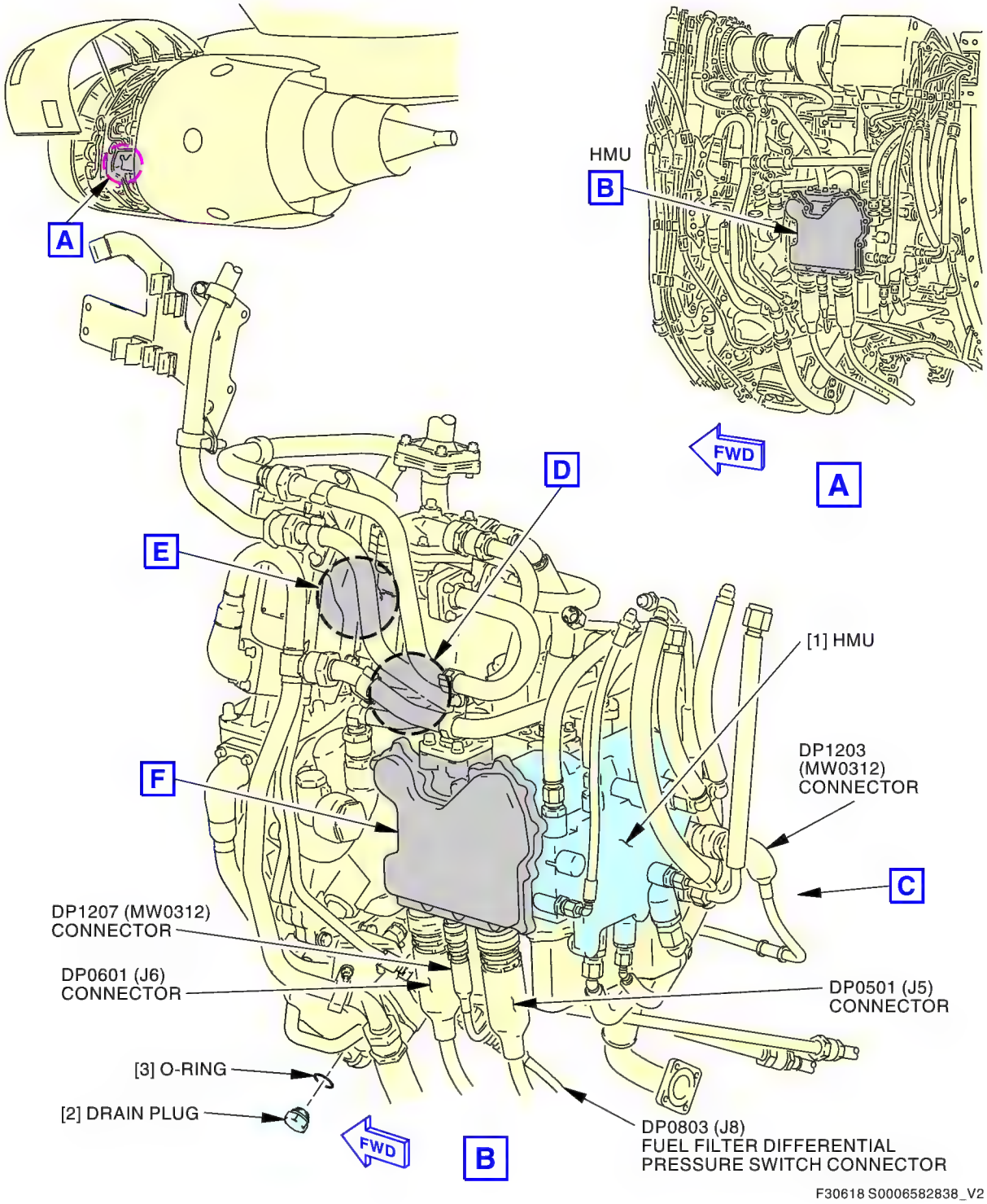
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Let the HMU sit on each of its four sides for approximately one minute.
2) Install protective covers on the ports and fittings of the HMU. Use the hardware from the installed HMU.

(f) Pack the HMU in two to three plastic bag, G00624 or equivalent.
1) Remove as much air as possible from the bags.
2) Seal each bag with waterproof tape, G00920.

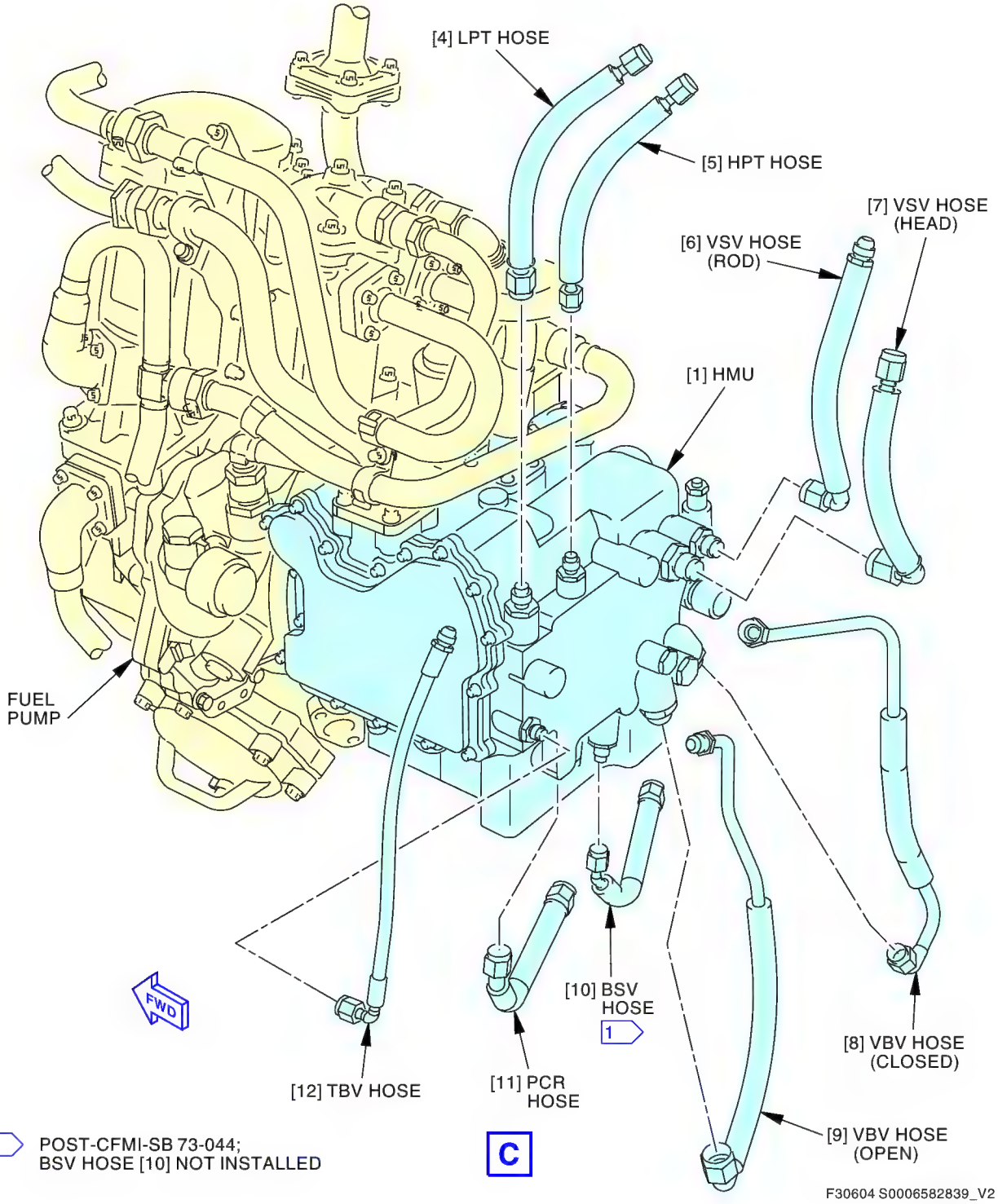
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



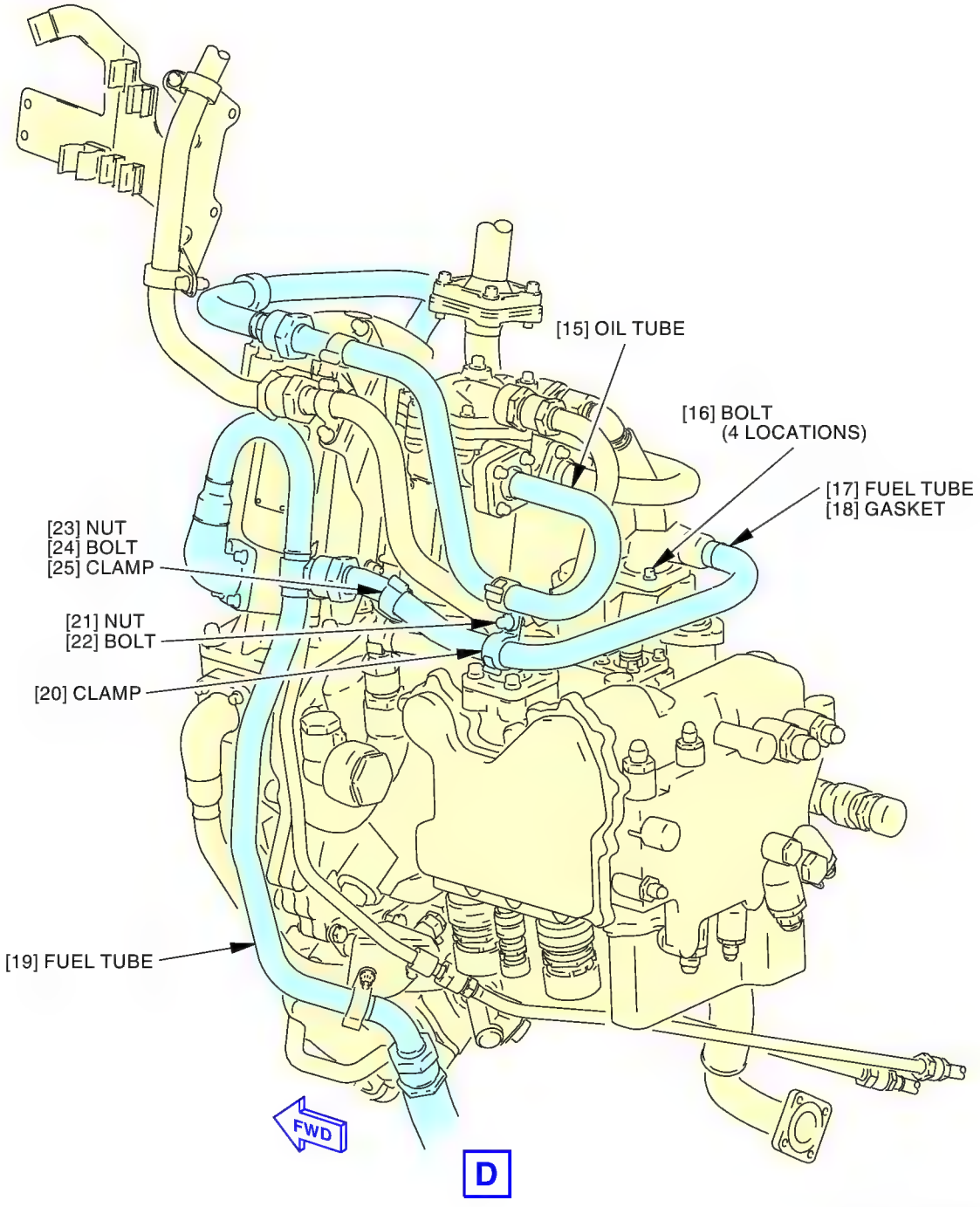
Hydromechanical Unit (HMU) Installation
Figure 401/73-21-10-990-801-F00 (Sheet 1 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



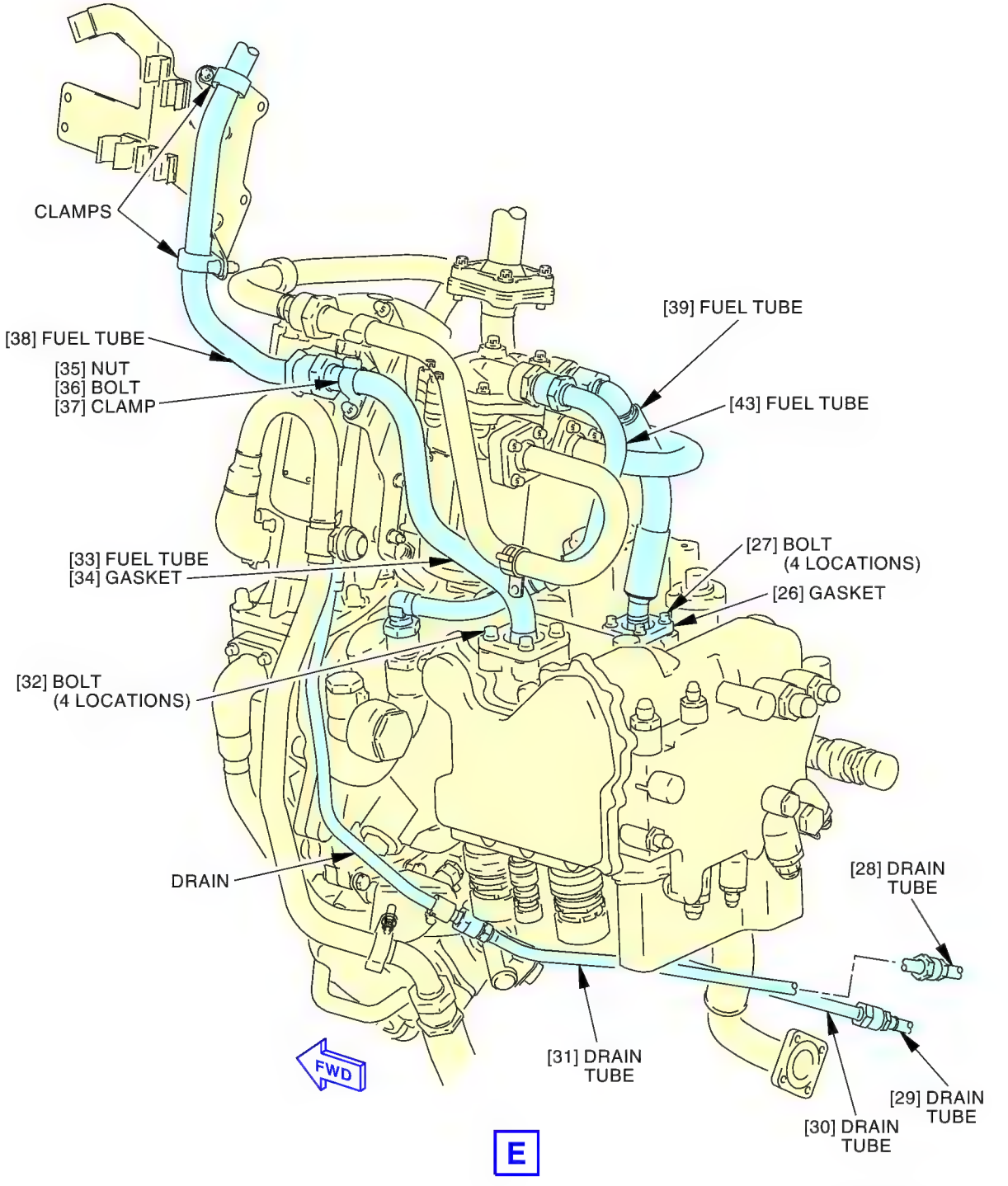
Hydromechanical Unit (HMU) Installation
Figure 401/73-21-10-990-801-F00 (Sheet 2 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



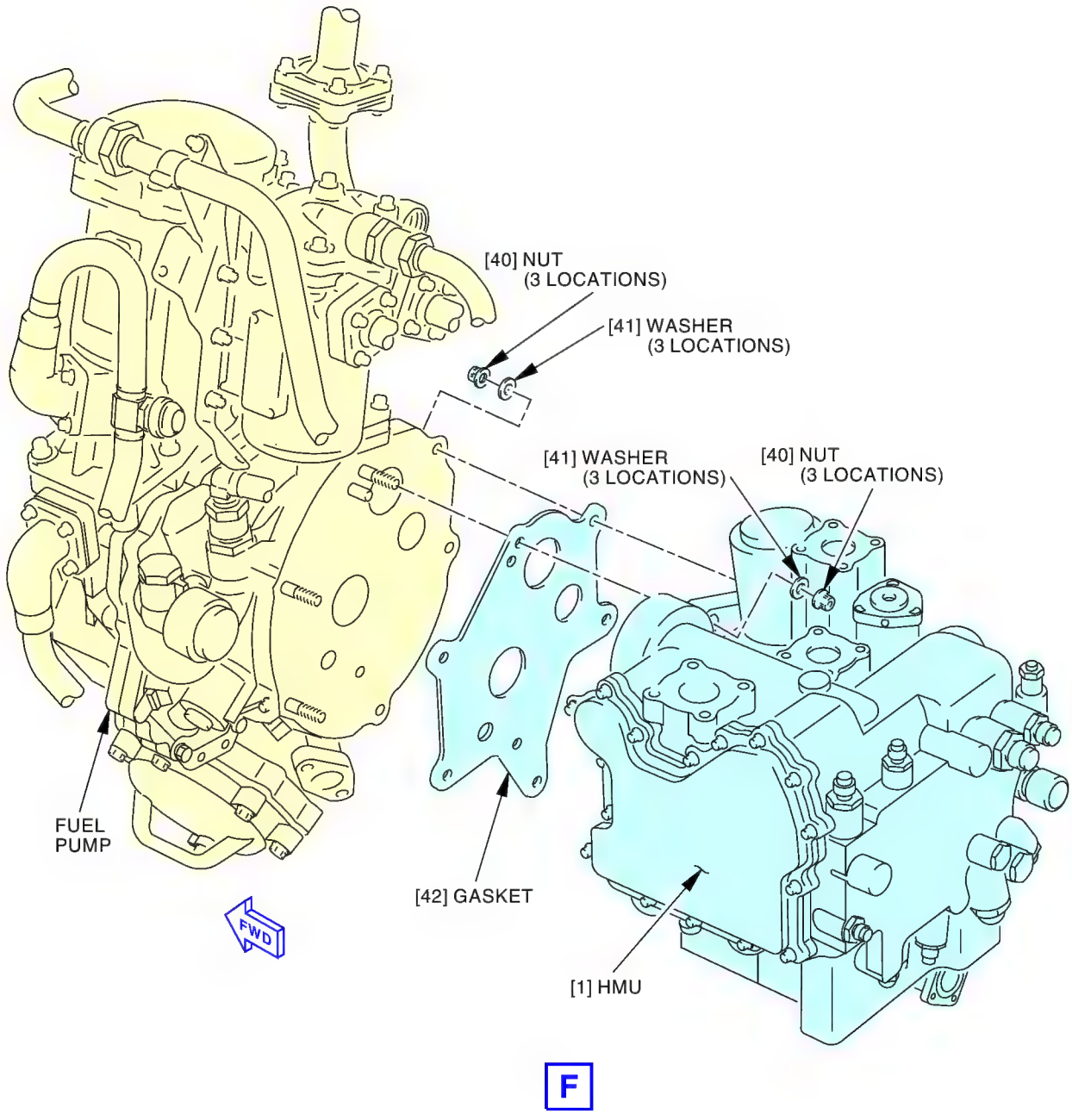
Hydromechanical Unit (HMU) Installation
Figure 401/73-21-10-990-801-F00 (Sheet 3 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Hydromechanical Unit (HMU) Installation
Figure 401/73-21-10-990-801-F00 (Sheet 4 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



G93371 S0006582844_V2

Hydromechanical Unit (HMU) Installation
Figure 401/73-21-10-990-801-F00 (Sheet 5 of 5)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-10-400-801-F00

3. HMU Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-20-02-400-801-F00	Tightening Practices and Torque Values (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
72-00-00-980-801-F00	Turn the N2 Rotor (P/B 201)
73-11-01-000-801-F00	Fuel Pump Package Removal (P/B 401)
73-11-01-400-801-F00	Fuel Pump Package Installation (P/B 401)
73-21-09-000-801-F00	High Pressure Shutoff Valve (HPSOV) Switch Removal (P/B 201)
73-21-09-400-801-F00	High Pressure Shutoff Valve (HPSOV) Switch Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2358	Set - Adapter, Torque Hydromechanical UN & MN Fuel Pump Nuts Part #: 856A1827G01 Supplier: 58828

C. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	HMU	73-21-10-01-090	IDC 001-006
		73-21-10-01A-085	IDC 007-010, 012-999
18	Gasket	73-11-00-02-260	IDC 001-006
		73-11-00-02A-310	IDC 007-010, 012-999
26	Gasket	73-11-00-02-125	IDC 001-006
		73-11-00-02A-170	IDC 007-010, 012-999
34	Gasket	73-11-00-02-100	IDC 001-006
		73-11-00-02A-155	IDC 007-010, 012-999

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
42	Gasket	73-21-10-01-060	IDC 001-006
		73-21-10-01A-060	IDC 007-010, 012-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 73-21-10-840-002-F00

(1) Do these steps to clean and examine the components for the HMU [1] installation:

(a) Remove the protective covers from the HMU [1], the fuel pump, and the fuel tube connections.

(b) Thoroughly clean the mating surfaces and the adjacent areas of the components.

NOTE: Failure to clean the adjacent areas can cause bubbles after HMU installation is complete.

(c) Examine the component mating surfaces and the adjacent areas to make sure that they are serviceable.

1) Replace the components that are not serviceable.

(d) Re-install the protective covers on the HMU [1], the fuel pump, and the fuel tube connections.

SUBTASK 73-21-10-210-003-F00

(2) Examine the studs on the fuel pump:

(a) If the threads on the fuel pump studs are not serviceable, then replace the fuel pump.

These are the tasks:

Fuel Pump Package Removal, TASK 73-11-01-000-801-F00,

Fuel Pump Package Installation, TASK 73-11-01-400-801-F00.

(b) Use your hand to move the ends of the fuel pump studs.

NOTE: The three studs on the fuel pump are key-locked studs. Due to the locking mechanism, you can feel a small lateral movement of the end of the studs.

1) If the ends of the studs move 0.062 inch (1.6 mm) or greater, then do these steps:

a) Use a small hammer and a punch to lightly hit the stud keys into the fuel pump housing.

b) Continue to lightly hit the keys until the stud movement is in the limits, or the key is flush with the inserted end of the stud.

c) If you can not get the stud movement into the limits, then replace the fuel pump.

These are the tasks:

Fuel Pump Package Removal, TASK 73-11-01-000-801-F00,

Fuel Pump Package Installation, TASK 73-11-01-400-801-F00.

2) If the stud movement is in the limits, then continue.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDC ALL PRE SB 737-CFM56-7B-73-067

SUBTASK 73-21-10-430-001-F00

(3) If it is necessary, install a new High Pressure Shutoff Valve (HPSOV) switch per the service bulletin.

(a) Or do these tasks: High Pressure Shutoff Valve (HPSOV) Switch Removal, TASK 73-21-09-000-801-F00, and High Pressure Shutoff Valve (HPSOV) Switch Installation, TASK 73-21-09-400-801-F00.

IDC ALL PRE SB 737-CFM56-7B-73-0108

SUBTASK 73-21-10-210-007-F00

(4) Make sure that you install the correct HMU, refer to the AIPC.

(a) HMUs with part number 1853M56P10 or P12 do not have the Burner Staging Valve (BSV) solenoid. The BSV must be deactivated for this HMU installation, refer to CFM-SB 73-0108.

IDC ALL

G. HMU Installation

SUBTASK 73-21-10-420-002-F00

WARNING BE CAREFUL WHEN YOU MOVE THE HMU. THE HMU WEIGHS 40 POUNDS (18 KILOGRAMS). THE WEIGHT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION DO NOT LIFT THE HMU BY THE DRIVE SHAFT. DO NOT LET THE DRIVE SHAFT HOLD THE WEIGHT OF THE HMU. IF THE DRIVE SHAFT HOLDS THE WEIGHT OF THE HMU, IT CAN CAUSE DAMAGE TO THE HMU SEALS.

CAUTION DO NOT HIT THE HMU AGAINST THE MFP DRIVE SHAFT WHEN YOU ALIGN THE HMU SPLINE WITH THE MFP DRIVE SHAFT. IT CAN CAUSE DAMAGE TO THE HMU INTERNAL SEALS.

(1) Install the HMU [1] on the fuel pump:

(a) Lubricate the three studs on the fuel pump with graphite mineral vaseline, D00601 [CP2101].

(b) Lubricate the three studs on the HMU with graphite mineral vaseline, D00601 [CP2101].

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(c) Lubricate the gasket [42] with oil, D00623 [CP5066].

(d) Remove the protective covers from the mating surfaces of the HMU and the fuel pump.

(e) Put the gasket [42] in its correct position on the fuel pump.

(f) Put the HMU [1] on the fuel pump.

1) If you cannot get the HMU shaft to align with the fuel pump, manually turn the N2 rotor until the HMU shaft engages the fuel pump (TASK 72-00-00-980-801-F00).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(g) Install the six washers [41] and nuts [40] on the studs to connect the HMU to the fuel pump.

NOTE: The three outboard studs are on the fuel pump and the three inboard studs are on the HMU.

CAUTION

MAKE SURE THAT THE TORQUE ADAPTER SET IS NOT DAMAGED. MAKE SURE THAT THE CENTERLINE OF THE ADAPTER ALIGNS WITH THE CENTERLINE OF THE TORQUE WRENCH SQUARE-DRIVE. IF YOU DO NOT ALIGN THE TORQUE WRENCH WITH THE ADAPTER CENTERLINE, YOU WILL GET INCORRECT TORQUE VALUES. DAMAGE TO EQUIPMENT CAN OCCUR.

1) Use the set, SPL-2358 to get access to the center inboard stud.

NOTE: If the tool is not available, then you can insert a long extension from the forward side, between the fan case and the accessory gearbox.

2) Torque the nuts [40] to 124-136 pound-inches (14.0-15.3 Newton meters).

NOTE: When you connect the lines to the HMU and fuel spills out of the lines, bubbles may occur after the HMU post-installation test. Bubbles are permitted if the bubbles stop after five minutes of engine operation at idle.

SUBTASK 73-21-10-020-011-F00

CAUTION

USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Install the drain tubes [30] and [31]:

(a) Remove the protective covers from the drain tubes [30] and [31] and the drain.

(b) Remove the applicable protective cover from the HMU.

WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(c) Lubricate the threads of the nipples with oil, D00623 [CP5066].

(d) Use your hands to connect the drain tube [31] to the drain and the drain tube [28].

1) Make sure that the drain tube [31] does not touch other components.

(e) Use two wrenches to torque the two coupling nuts to 257-284 pound-inches (29-32 Newton meters).

(f) Use your hands to connect the drain tube [30] to the bottom of the HMU and the drain tube [29].

1) Make sure that the drain tube [30] does not touch other components.

(g) Use two wrenches to torque the coupling nuts to 257-284 pound-inches (29-32 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-10-020-012-F00

CAUTION

MAKE SURE THAT YOU USE APPROVED BOLTS WHEN YOU CONNECT THE LINES TO THE HMU. INSTALLATION OF INCORRECT ATTACHMENT BOLTS CAN CAUSE AN IN-FLIGHT FUEL LEAK.

CAUTION

USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(3) Do these steps to install the fuel tube [33]:

NOTE: When you connect the lines to the HMU and fuel spills out of the lines, bubbles may occur after installation. Bubbles are acceptable provided the bubbles stop after three cycles.

(a) Remove the protective covers from the fuel tube [33] and the fuel tube [38].

(b) Remove the applicable protective covers from the HMU.

(c) Lubricate these parts:

WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [34] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [32] and [36] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

CAUTION

LOOK AT THE GASKET BEFORE YOU INSTALL IT. OBEY THE INSTRUCTIONS IN SEALS (PREFORMED PACKINGS AND O-RINGS) AND GASKETS, TASK 70-30-01-910-802-F00. DO NOT CAUSE DAMAGE TO THE RUBBER SEAL WHEN YOU INSTALL THE GASKET.

(d) Put the fuel tube [33] and the gasket [34] in the correct position between the HMU and the fuel tube [38].

(e) Install and hand tighten the 4 bolts [32] that hold the fuel tube [33] and gasket [34] to the HMU [1].

IDC ALL POST SB 737-CFM56-7B-72-0068

NOTE: Use the longer length bolts [32] (AS3237-14) for the fuel tube [33] installation.

IDC ALL

(f) Use your hands to connect the fuel tube [33] to the fuel tube [38].

(g) Install and hand tighten the nut [35], bolt [36], and clamp [37] that hold the tube [33] to the bracket.

(h) Make sure that the fuel tube [33] is in its correct position.

1) Make sure that there is no gap between the fuel tube [33] and the gasket [34] or between the gasket [34] and the HMU.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CAUTION TIGHTEN THE BOLTS CORRECTLY. REFER TO TIGHTENING PRACTICES AND TORQUE VALUES, TASK 70-20-02-400-801-F00. IF YOU TIGHTEN THEM INCORRECTLY, DAMAGE TO THE PARTS CAN OCCUR.

(i) Torque the bolts [32] to 98-110 pound-inches (11.0-12.5 Newton meters).

(j) Use two wrenches to torque the coupling nut between the fuel tubes [33] and [38] to 900-1100 pound-inches (100-125 Newton meters).

(k) If you loosened the clamps that holds the fuel tube [38] to the bracket above the fuel pump package, then torque the clamp bolts to 98-110 pound-inches (11.0-12.5 Newton meters).

(l) Torque the nut [35] to 98-110 pound-inches (11.0-12.5 Newton meters).

SUBTASK 73-21-10-020-013-F00

CAUTION MAKE SURE THAT YOU USE APPROVED BOLTS WHEN YOU CONNECT THE LINES TO THE HMU. INSTALLATION OF INCORRECT ATTACHMENT BOLTS CAN CAUSE AN IN-FLIGHT FUEL LEAK.

CAUTION USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

CAUTION DO NOT APPLY TOO MUCH BENDING LOAD ON THE FUEL TUBE WHEN YOU INSTALL IT. TOO MUCH BENDING CAN CAUSE DAMAGE TO THE PART.

(4) Do these steps to install the fuel tube [39]:

NOTE: When you connect the lines to the HMU and fuel spills out of the lines, bubbles may occur after installation. Bubbles are acceptable provided the bubbles stop after three cycles.

(a) Remove the protective covers from the fuel tube [39], servo-fuel heater, and HMU.

(b) Lubricate these parts:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [26] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [27] with graphite mineral vaseline, D00601 [CP2101].

3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the fuel tube [39] and the gasket [26] in the correct position between the HMU and the servo-fuel heater.

(d) Install and hand tighten the four bolts [27] that hold the fuel tube [39] and the gasket [26] to the HMU [1].

(e) Connect and hand tighten the fuel tube [39] to the servo-fuel heater.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) Torque the bolts [27] to 49-53 pound-inches (5.5-6.0 Newton meters).

(g) Use two wrenches to torque the coupling nut between the fuel tube [39] and the servo-fuel heater to 650-770 pound-inches (75-85 Newton meters).

SUBTASK 73-21-10-430-002-F00

CAUTION: USE TWO WRENCHES WHEN YOU LOOSEN OR TIGHTEN THE CONNECTION. ONE WRENCH WILL HOLD ONE SIDE OF THE CONNECTION IN ITS POSITION. ONE WRENCH WILL TURN THE OTHER SIDE OF THE CONNECTION. IF YOU DO NOT OBEY THIS TWO-WRENCH PROCEDURE, YOU CAN CAUSE DAMAGE TO THE CONNECTION COMPONENTS.

(5) Do these steps to install the fuel tube [43]:

NOTE: When you connect the lines to the HMU and fuel spills out of the lines, bubbles may occur after installation. Bubbles are acceptable provided the bubbles stop after three cycles.

(a) Remove the protective covers from the fuel tube [43], servo-fuel heater and fuel pump.

(b) Lubricate the threads of the nipples with oil, D00623 [CP5066]

(c) Put the fuel tube [43] in the correct position between the servo-fuel heater inlet port and the fuel pump.

(d) Connect and hand tighten the fuel tube [43] to the servo-fuel heater.

(e) Connect and hand tighten the fuel tube [43] to the fuel pump.

(f) Use two wrenches to torque the two coupling nuts to 650-770 pound-inches (75-85 Newton meters).

SUBTASK 73-21-10-020-014-F00

CAUTION: MAKE SURE THAT YOU USE APPROVED BOLTS WHEN YOU CONNECT THE LINES TO THE HMU. INSTALLATION OF INCORRECT ATTACHMENT BOLTS CAN CAUSE AN IN-FLIGHT FUEL LEAK.

CAUTION: USE TWO WRENCHES TO TORQUE THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(6) Do these steps to install the fuel tube [17]:

NOTE: When you connect the lines to the HMU and fuel spills out of the lines, bubbles may occur after installation. Bubbles are acceptable provided the bubbles stop after three cycles.

(a) Remove the protective covers from the fuel tube [17], the fuel tube [19] and the HMU [1].

(b) Lubricate these parts:

WARNING: DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the gasket [18] with oil, D00623 [CP5066].

2) Lubricate the threads of the bolts [16], [22], and [24] with graphite mineral vaseline, D00601 [CP2101].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Lubricate the threads of the nipple with oil, D00623 [CP5066].

(c) Put the fuel tube [17] and the gasket [18] in the correct position between the fuel tube [19] and the HMU [1].

(d) Install and hand tighten the four bolts [16] that hold the tube [17] and the gasket [18] to the HMU [1].

(e) Connect and hand tighten the fuel tube [17] to the fuel tube [19].

(f) Do these steps to connect the fuel tube [17] and the oil tube [15] to the brackets:

1) Put the clamp on the oil tube [15] in its correct position at the bracket.

CAUTION MAKE SURE THAT THE CLAMPS DO NOT INTERFERE WITH THE HMU, THE FUEL TUBES OR THE OIL TUBES. IF INTERFERENCE OCCURS, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

2) Put the clamp [20] in its correct position on the fuel tube [17].

a) Make sure that the clamp [20], the clamp on the oil tube [15], and the bracket align.

3) Use your hand to install the nut [21] and bolt [22] that hold the clamps and the tubes [15] and [17] to the bracket.

(g) Install and hand tighten the nut [23], bolt [24], and clamp [25] that hold the tube [17] to the fuel pump.

(h) Torque the bolts [16] to 49-53 pound-inches (5.5-6.0 Newton meters).

NOTE: To aid in the proper installation of the four bolts [16], a 20 inch (50 cm) extension can be used to tighten the 2 inboard bolts. A 2 inch (5 cm) deep-well socket can be used to remove the 2 outboard bolts. Be sure to apply torque at 90 degrees to the centerline of the bolt.

(i) Use two wrenches to torque the coupling nut, between the fuel tubes [17] and [19], to 900-1100 pound-inches (100-125 Newton meters).

(j) Torque the nuts [21] and [23] for the clamps [20] and [25] to 98-110 pound-inches (11.0-12.5 Newton meters).

SUBTASK 73-21-10-420-006-F00

CAUTION USE TWO WRENCHES TO TORQUE THE HOSE COUPLING NUTS. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TORQUE THE HOSE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE HOSE AND NIPPLE CAN OCCUR.

(7) Connect these hoses to the HMU [1]:

NOTE: When you connect the lines to the HMU and fuel spills out of the lines, bubbles may occur after installation. Bubbles are acceptable provided the bubbles stop after three cycles.

NOTE: The hose installations are arranged so that same wrenches and torque values are used at the same time.

(a) Remove the protective covers from the hoses and the HMU.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(b) Lubricate the threads of the nipples with oil, D00623 [CP5066].

(c) Install and hand tighten these hoses:

1) The HPT hose [5].

IDC ALL PRE SB CFM56-7B 73-44

2) The BSV hose [10].

NOTE: Engine POST CFMI SB 73-044 do not have the BSV hose [10] installed.

IDC ALL

3) The TBV hose [12].

4) Use two wrenches to torque the coupling nuts on the hoses [5], [10], and [12] to 135-150 pound-inches (15.3-17.0 Newton meters).

NOTE: Engine with CFMI SB 73-044 do not have the BSV hose [10] installed.

IDC ALL POST SB CFM56-7B 73-44

(d) If it is necessary, do these steps to install the plug in place of the BSV hose [10].

NOTE: For the plug Part Number, refer to IPC 73-21-10.

1) Lubricate the threads of the plug with oil, D00623 [CP5066].

2) Install the plug in place of the BSV hose [10].

3) Torque the plug to 135-150 pound-inches (15.3-17.0 Newton meters).

IDC ALL

(e) Install and hand tighten these hoses:

1) The LPT hose [4]

2) The VSV hose (ROD) [6]

3) The VBV hose (CLOSED) [8]

4) The PCR hose [11].

5) Use two wrenches to torque the coupling nuts on the hoses [4], [6], [8], and [11] to 270-300 pound-inches (30.0-35.0 Newton meters).

(f) Install and hand tighten these hoses:

1) The VSV hose (HEAD) [7]

2) The VBV hose (OPEN) [9].

3) Use two wrenches to torque the coupling nuts on the hoses [7] and [9] to 450-550 pound-inches (50.0-60.0 Newton meters).

SUBTASK 73-21-10-210-004-F00

(8) Make sure that the electrical power is removed from the airplane while you install the electrical connectors.

(a) If it is necessary, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 73-21-10-420-007-F00

(9) Connect these electrical connectors to the HMU:

NOTE: If it is necessary, you can use soft-nose pliers to turn the connector nuts.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective covers from the electrical connectors and the receptacles.

(b) The DP0803 (J8) connector on the fuel filter differential pressure switch.

(c) The DP0601 (J6) connector.

(d) The DP1207 (MW0312) connector.

(e) The DP0501 (J5) connector.

(f) The DP1203 (MW0312) connector.

SUBTASK 73-21-10-210-002-F00

(10) Remove the cranking tool and install the handcranking drive cover on the gearbox drive pad (TASK 72-00-00-980-801-F00).

H. HMU Installation Test

SUBTASK 73-21-10-840-003-F00

(1) Do these steps to prepare for the installation test:

(a) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(b) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

SUBTASK 73-21-10-730-001-F00

(2) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

CAUTION

DO NOT MOTOR THE ENGINE BEFORE VERIFYING THAT THE FUEL SPAR VALVE IS IN THE OPEN POSITION AND FUEL BOOST PUMP PRESSURE IS APPLIED TO THE FUEL PUMP INLET. THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT ARE FUEL LUBRICATED, ZERO FUEL PRESSURE CAN CAUSE DAMAGE TO THE FUEL PUMP AND THE HYDRO MECHANICAL UNIT.

(a) If it is necessary to dry motor the engine, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

(b) If bubbling is seen from the HMU front cover or Electro-Hydraulic Servo Valve (EHSV) cover parting flanges for the HMU leak check, do these steps:

NOTE: Residual fuel from the HMU connections can be the cause. The HMU front cover and EHSV cover are not fluid tight. Heat from the HMU operation forces the air contained in the cavity to escape and create bubbles.

1) The bubbling occurs during engine operation. With the engine shutdown, look for signs of fuel leakage [wetting] at the above areas of the HMU.

2) Dry the area with compressed air along the applicable parting surfaces.

3) Do the leak check again.

a) If the bubbles continue from the HMU front cover or EHSV cover flange, create a maintenance carry-over and continue in service

b) Do an inspection of the HMU for leaks and bubbling after three flights.

c) If bubbles are present after three flights, replace the HMU.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

ENGINE CONTROL MODULE - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks:

(1) The removal of the engine control module

(2) The installation of the engine control module which also includes a post-installation test.

TASK 73-21-12-000-801-F00

2. Engine Control Module Removal

(Figure 401)

A. General

(1) This procedure is for the removal of the engine control module (P5-68).

(2) The engine control module (P5-68) is on the P5 Aft Overhead Panel in the flight compartment.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

C. Procedure

SUBTASK 73-21-12-840-001-F00

(1) Do these steps:

(a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	13	C01277	MASTER CAUTION ANNUNCIATOR CONT 3
F	13	C01179	INDICATOR MASTER DIM SECT 7
F	14	C01180	INDICATOR MASTER DIM SECT 8

(b) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(c) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-12-000-001-F00

(2) Do these steps to remove the engine control module:

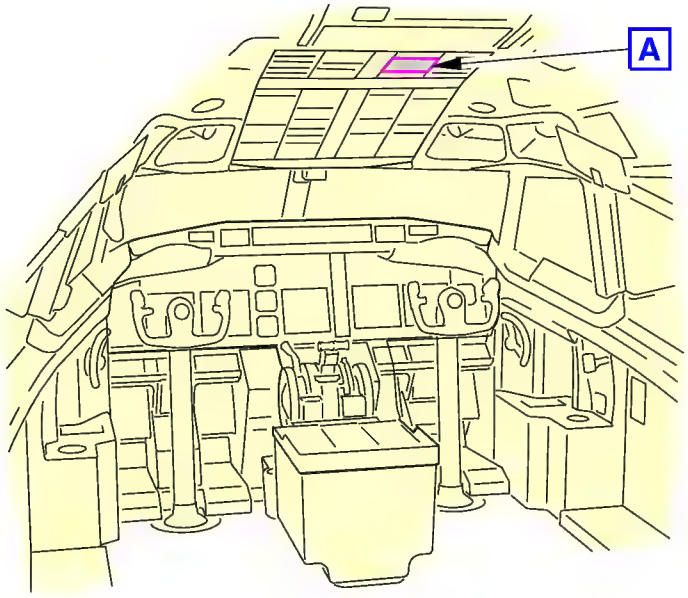
(a) Loosen the four quarter-turn fasteners on the front of the module.

(b) Remove the module from the P5 Aft Overhead Panel.

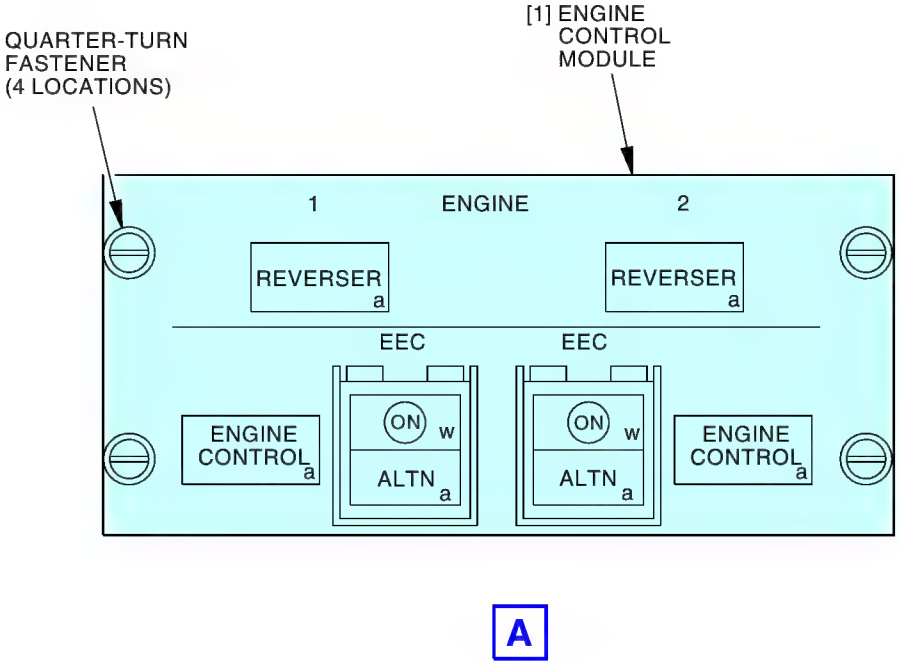
(c) Remove the two electrical connectors from the rear of the module.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



FLIGHT COMPARTMENT



N47521 S0006582855_V2

Engine Control Module (P5-68) Installation
Figure 401/73-21-12-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-12-400-801-F00

3. Engine Control Module Installation

(Figure 401)

A. General

(1) This procedure is for the installation of the engine control module (P5-68).

(2) The engine control module (P5-68) is on the P5 Aft Overhead Panel in the flight compartment.

B. References

Reference	Title
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. Module Installation

SUBTASK 73-21-12-400-001-F00

(1) Do these steps to install the engine control module:

(a) Connect the two electrical connectors at the rear of the module.

(b) Install the module into the P5 Aft Overhead Panel.

(c) Tighten the four quarter-turn fasteners on the front of the module.

SUBTASK 73-21-12-840-002-F00

(2) Do these steps:

(a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	13	C01277	MASTER CAUTION ANNUNCIATOR CONT 3
F	13	C01179	INDICATOR MASTER DIM SECT 7
F	14	C01180	INDICATOR MASTER DIM SECT 8

(b) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(c) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

E. Module Installation Test

SUBTASK 73-21-12-860-001-F00

(1) On the engine control module, put each EEC ON switch to the ON position.

(a) Make sure the applicable EEC ON light (white) comes on.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-12-860-002-F00

(2) For each EEC, do this task: EEC TEST, TASK 73-21-00-700-804-F00.

(a) During the test, make sure these applicable lights on the engine control module come ON:

1) ENGINE CONTROL (amber)

2) EEC ALTN (amber)

3) The MASTER CAUTION light on the P7 glareshield will also come ON if one of the above amber lights comes on.

SUBTASK 73-21-12-860-004-F00

(3) Do these steps to examine the EEC ON/ALTN switch:

(a) Make sure all fuel pump switches are in the OFF position.

(b) Move the Engine 1 start lever to the IDLE position.

(c) Push the Engine 1 EEC ON switch so that ON goes off.

(d) Make sure Engine 1 amber ALTN light comes on.

(e) Push the Engine 1 EEC ON switch so that the ON shows.

(f) Make sure Engine 1 amber ALTN light goes off.

(g) Move the Engine 1 start lever to the CUTOFF position.

(h) Move the Engine 2 start lever to the IDLE position.

(i) Push the Engine 2 EEC ON switch so that ON goes off.

(j) Make sure Engine 2 amber ALTN light comes on.

(k) Push the Engine 2 EEC ON switch so that the ON shows.

(l) Make sure Engine 2 amber ALTN light goes off.

(m) Move the Engine 2 start lever to the CUTOFF position.

SUBTASK 73-21-12-860-003-F00

(4) For each engine, do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) During the test, make sure the applicable REVERSER light (amber) on the engine control module come ON.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

ELECTRONIC ENGINE CONTROL - MAINTENANCE PRACTICES

1. General

IDC ALL PRE SB 737-CFM56-7B-73-0219

A. This procedure contains two tasks. The first is the task to load the software into the EEC, as software updates become available. The second is the task to retrieve Non-Volatile Memory (NVM) data from the EEC. Retrieving NVM data from an EEC is also referred to as downloading NVM.

IDC ALL POST SB 737-CFM56-7B-73-0219

B. This task contains instructions to load the software into the EEC, as software updates become available.

IDC ALL

TASK 73-21-60-470-801-F00

2. EEC Software Load

A. General

(1) These tools are necessary when reprogramming the EEC:

(a) ARINC 615 data loader, COM-261, CFMI recommends a Sundstrand, Demo Systems PDL, Demo Systems PMAT 2000 or equivalent.

(b) CFMI PDL (interface) adapter cable, part number 856A1616G02 or equivalent or Demo Systems PMAT (interface) adapter cable, part number 80046–1 or EEC adapter cable, COM-11091, or equivalent.

(c) CFMI PDL (interface) adapter cable, part number 704–2389–01, PDL to EEC adapter cable, SPL-14314.

(d) Demo Systems PMAT External CD-ROM, part number 80751–1 (optional) or external CD-ROM drive, COM-11092.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)
73-21-00-700-808-F00	IDENT/CONFIG (P/B 501)
73-21-00-740-801-F00	EEC BITE TEST - FAULT HISTORY (P/B 501)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Reference	Description
COM-261	Data Loader - ARINC 615 Part #: 11615-50 Supplier: 0D4J3 Part #: AE-615-MPDL Supplier: CD624 Part #: CEI-715-DL-2 Supplier: 0BPH5 Part #: P2K-615A-06 Supplier: 0BAW0 Opt Part #: 11615-20 Supplier: 0D4J3 Opt Part #: 30100 Supplier: 0BAW0 Opt Part #: 80000-05 Supplier: 0BAW0 Opt Part #: 964-0400-020 Supplier: 97896 Opt Part #: 964-0400-025 Supplier: 97896 Opt Part #: 964-0400-030 Supplier: 97896 Opt Part #: 964-0400-055 Supplier: 97896 Opt Part #: 964-0400-060 Supplier: 97896 Opt Part #: 964-0400-064 Supplier: 97896 Opt Part #: 964-0400-065 Supplier: 97896
COM-11091	ADAPTER CABLE - EEC DATALOADING Part #: 110602003-00 Supplier: 0D4J3 Part #: 856A1616G02 Supplier: 07482
COM-11092	DRIVE - EXTERNAL, CD-ROM (PMAT 2000 ONLY) Part #: 80800-3 Supplier: 0BAW0 Opt Part #: 80751-1 Supplier: 0BAW0
SPL-14314	Adapter Cable - Honeywell PDL to EEC Data Load Cable Part #: 704-2389-001 Supplier: 97896

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. EEC Software Interchangeability

SUBTASK 73-21-60-800-003-F00

(1) Some EEC software is necessary for the airplane Flight Management Computer (FMC), engine and thrust reversers.

(a) This EEC software is necessary to comply with European Aviation Safety Agency (EASA) Airworthiness Directive (AD) number 2014-0261 and Federal Aviation Administration (FAA) AD No. 2015-04-02.

1) FADEC 2, 1853M78P36 and later.

2) FADEC 3, 2044M25P17 and later.

(b) This EEC software is necessary on airplanes operated with CFM56-7BE engines.

1) FADEC 2, 1853M78P33 and later.

2) FADEC 3, 2044M25P14 and later.

(c) In-flight idle changes in later EEC software change the necessary FMC-MEDB software. The EEC software and the FMC-MEDB software must be compatible.

(d) This EEC software is necessary for substitution/intermix of a CFM56-7BE engine with either a CFM Tech Insertion engine HPC compressor kt or CFM56-7B/3 Technology Insertion engine or SAC engines.

1) FADEC 2, 1853M78P33 and later.

2) FADEC 3, 2044M25P14 and later.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

3) Refer to the applicable service bulletin for the engine intermix data.

(e) This EEC software is necessary for substitution/intermix of either a CFM Tech Insertion engine HPC compressor kt or CFM56-7B/3 Technology Insertion Engine with SAC or DAC engines.

1) FADEC 2, 1853M78P27 and later.

2) FADEC 3, 2044M25P07 and later.

3) Refer to the applicable service bulletin for the engine intermix data.

(f) This EEC software is necessary for thrust reversers modified by 737-SB 78-1079.

1) FADEC 2, 1853M78P27 and later.

2) FADEC 3, 2044M25P07 and later.

3) Refer to the service bulletin for the thrust reverser changes.

SUBTASK 73-21-60-800-001-F00

(2) Make sure that the EEC software and the Flight Management Computer - Model Engine Data Base (FMC-MEDB) versions are compatible (Table 201).

(a) In-flight idle changes in later EEC software change the necessary FMC-MEDB software.

(b) The table shows the compatible software.

(c) Refer to the applicable FMC service bulletin for more data.

Table 201/73-21-60-993-810-F00 EEC Software and FMC-MEDB Software

EEC Software Part Number	FMC-MEDB Part Number	FMC OPS Version	Retrofit FMC SB
1853M78P22 to 1853M78P25, and 2044M25P03 to 2044M25P05	BCG-005-B1	U10.3 / U10.4 / U10.4A	N/A
	BCG-005-D2	U10.2 / U10.2A	34-1562
	BCG-005-D3	U10.3 / U10.4 / U10.4A	34-1503
	BCG-00N-H6	U10.5 / U10.5A	34-1650
	BCG-00T-N1	U10.5 / U10.5A / U10.6	34-1768
	BCG-014-66	U10.5 / U10.5A / U10.6	N/A
1853M78P25 and later, and 2044M25P04 and later	BCG-014-P4	U10.6	N/A
1853M78P27 and later, and 2044M25P07 and later	BCG-014-A2	U10.6 / U10.7	34-1918
	BCG-014-V9	U10.6 / U10.7	N/A
	BCG-016-D0	U10.7	N/A
	BCG-016-F9	U10.8 / U10.8A / U11 / U12	34-A2104
	BCG-016-G1	U10.8A / U11 / U12 / U13/ U14	34-A2216

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 201/73-21-60-993-810-F00 EEC Software and FMC-MEDB Software (Continued)

EEC Software Part Number	FMC-MEDB Part Number	FMC OPS Version	Retrofit FMC SB
	BCG-01J-05	U10.8A / U11 / U12 / U13/ U14	34-A2216
	BCG-01P-B6	U10.8A / U11 / U12 / U13/ U14	34-2576 / 34–2600
	BCG-01T-A0	U10.8A / U11 / U12 / U13/ U14	34-2906

SUBTASK 73-21-60-800-002-F00

(3) Make sure that the EEC software versions on the two engines are compatible (Table 202).

(a) Different EEC software can be installed on each of the two engines.

(b) Applicable FMC-MEDB software can be necessary.

(c) For EEC software intermix, use the preferred EEC software/hardware configuration:

1) A combination of 2044M25P19 (FADEC 3) or 1853M78P39 (FADEC 2).

(d) The table only shows approved software versions 1853M78P22 and later.

Table 202/73-21-60-993-811-F00 EEC Software Intermix

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 2	1853M78P22 (7.B.O)	FADEC 2	1853M78P24	
FADEC 2	1853M78P22	FADEC 2	1853M78P25	*[2]
FADEC 2	1853M78P22	FADEC 3	2044M25P03	*[1]
FADEC 2	1853M78P22	FADEC 3	2044M25P04	*[2] *[1]
FADEC 2	1853M78P22	FADEC 3	2044M25P05	*[2] *[1]
FADEC 2	1853M78P24 (7.B.P)	FADEC 2	1853M78P22	
FADEC 2	1853M78P24	FADEC 2	1853M78P25	*[2]
FADEC 2	1853M78P24	FADEC 3	2044M25P03	*[1]
FADEC 2	1853M78P24	FADEC 3	2044M25P04	*[2] *[1]
FADEC 2	1853M78P24	FADEC 3	2044M25P05	*[2] *[1]
FADEC 2	1853M78P25 (7.B.QF2)	FADEC 2	1853M78P22	*[2]
FADEC 2	1853M78P25	FADEC 2	1853M78P24	*[2]
FADEC 2	1853M78P25	FADEC 3	2044M25P03	*[2] *[1]
FADEC 2	1853M78P25	FADEC 3	2044M25P04	*[1]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 2	1853M78P25	FADEC 3	2044M25P05	*[1]
FADEC 3	2044M25P03 (7.B.PF3)	FADEC 2	1853M78P22	*[1]
FADEC 3	2044M25P03	FADEC 2	1853M78P24	*[1]
FADEC 3	2044M25P03	FADEC 2	1853M78P25	*[2] *[1]
FADEC 3	2044M25P03	FADEC 3	2044M25P04	*[2]
FADEC 3	2044M25P03	FADEC 3	2044M25P05	*[2]
FADEC 3	2044M25P04 (7.B.QF3)	FADEC 2	1853M78P22	*[2] *[1]
FADEC 3	2044M25P04	FADEC 2	1853M78P24	*[2] *[1]
FADEC 3	2044M25P04	FADEC 2	1853M78P25	*[1]
FADEC 3	2044M25P04	FADEC 3	2044M25P03	*[2]
FADEC 3	2044M25P04	FADEC 3	2044M25P05	
FADEC 3	2044M25P05 (7.B.Q1F3)	FADEC 2	1853M78P22	*[2] *[1]
FADEC 3	2044M25P05	FADEC 2	1853M78P24	*[2] *[1]
FADEC 3	2044M25P05	FADEC 2	1853M78P25	*[1]
FADEC 3	2044M25P05	FADEC 3	2044M25P03	*[2]
FADEC 3	2044M25P05	FADEC 3	2044M25P04	
FADEC 2	1853M78P27 (7.B.R3F2)	FADEC 2	1853M78P28	*[4] *[5]
FADEC 2	1853M78P27	FADEC 3	2044M25P07	*[1] *[4] *[5]
FADEC 2	1853M78P27	FADEC 3	2044M25P08	*[1] *[4] *[5]
FADEC 2	1853M78P27	FADEC 3	2044M25P09	*[1] *[4] *[5] *[6]
FADEC 2	1853M78P28 (7.B.SF2)	FADEC 2	1853M78P27	*[4] *[5]
FADEC 2	1853M78P28	FADEC 3	2044M25P07	*[1] *[4] *[5]
FADEC 2	1853M78P28	FADEC 3	2044M25P08	*[1] *[4] *[5]
FADEC 2	1853M78P28	FADEC 3	2044M25P09	*[1] *[4] *[5] *[6]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 3	2044M25P07 (7.B.R3F3)	FADEC 2	1853M78P27	*[1] *[4] *[5]
FADEC 3	2044M25P07	FADEC 2	1853M78P28	*[1] *[4] *[5]
FADEC 3	2044M25P07	FADEC 3	2044M25P08	*[4] *[5]
FADEC 3	2044M25P07	FADEC 3	2044M25P09	*[4] *[5] *[6]
FADEC 3	2044M25P08 (7.B.SF3)	FADEC 2	1853M78P27	*[1] *[4] *[5]
FADEC 3	2044M25P08	FADEC 2	1853M78P28	*[1] *[4] *[5]
FADEC 3	2044M25P08	FADEC 3	2044M25P07	*[4] *[5]
FADEC 3	2044M25P08	FADEC 3	2044M25P09	*[4] *[5] *[6]
FADEC 3	2044M25P09 (7.B.S1F3)	FADEC 2	1853M78P27	*[1] *[4] *[5] *[6]
FADEC 3	2044M25P09	FADEC 2	1853M78P28	*[1] *[4] *[5] *[6]
FADEC 3	2044M25P09	FADEC 3	2044M25P07	*[4] *[5] *[6]
FADEC 3	2044M25P09	FADEC 3	2044M25P08	*[4] *[5] *[6]
FADEC 2	1853M78P29 (7.B.TF2)	FADEC 3	2044M25P10	*[1] *[4] *[5] *[6] *[3]
FADEC 3	2044M25P10 (7.B.TF3)	FADEC 2	1853M78P29	*[1] *[4] *[5] *[6] *[3]
FADEC 2	1853M78P31 (7.B.U1F2)	FADEC 3	2044M25P12	*[1] *[4] *[5] *[6] *[3]
FADEC 3	2044M25P12 (7.B.U1F3)	FADEC 2	1853M78P31	*[1] *[4] *[5] *[6] *[3]
FADEC 2	1853M78P33 (7.B.V2F2)	FADEC 3	2044M25P14	*[1] *[4] *[5] *[6] *[7]
FADEC 3	2044M25P14 (7.B.V2F3)	FADEC 2	1853M78P33	*[1] *[4] *[5] *[6] *[7]
FADEC 3	2044M25P17 (7.B.WF3)	FADEC 2	1853M78P37	*[1] *[4] *[5] *[6] *[7]*[8]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 2	1853M78P37 (7.B.WF2)	FADEC 3	2044M25P17	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P36 (7.B.WF2)	FADEC 3	2044M25P17	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.WF3)	FADEC 2	1853M78P36	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 2	1853M78P37 (7.B.W F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 2	1853M78P36 (7.B.W F2) DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 2	1853M78P37 (7.B.W F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3)	FADEC 2	1853M78P36 (7.B.W F2) DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P37 (7.B.W F2) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P37 (7.B.W F2) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P37 (7.B.W F2) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P37 (7.B.W F2) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 2	1853M78P37 (7.B.W F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 2	1853M78P36 (7.B.W F2) DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 2	1853M78P37 (7.B.W F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 2	1853M78P36 (7.B.W F2) DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 2	1853M78P36 (7.B.W F2) DAC	*[1] *[4] *[5] *[6] *[7]*[8]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 2	1853M78P37 (7.B.W F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 2	1853M78P36 (7.B.W F2) DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 2	1853M78P37 (7.B.W F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 2	1853M78P38 (7.B.W1 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 2	1853M78P39 (7.B.W2 F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 3	2044M25P18 (7.B.W1 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 3	2044M25P19 (7.B.W2 F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P36 (7.B.W F2) DAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P37 (7.B.W F2) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P20 (7.B.X F3) SAC	FADEC 2	1853M78P40 (7.B.X F2) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P36 (7.B.W F2) DAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 202/73-21-60-993-811-F00 EEC Software Intermix (Continued)

Engine 1 (Left) Hardware	Software Part Number (Version)	Engine 2 (Right) Hardware	Software Part Number	Installation Restriction Notes
FADEC 2	1853M78P37 (7.B.W F2) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P38 (7.B.W1 F2) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P39 (7.B.W2 F2) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 2	1853M78P40 (7.B.X F2) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P17 (7.B.W F3) SAC & DAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P18 (7.B.W1 F3) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]
FADEC 3	2044M25P19 (7.B.W2 F3) SAC	FADEC 3	2044M25P20 (7.B.X F3) SAC	*[1] *[4] *[5] *[6] *[7]*[8]

*[1] FADEC 2 and FADEC 3 EECs are functionally interchangeable on the engine. However hardware specific software is necessary that is not interchangeable between the two hardware types.

*[2] Intermix of 1853M78P25 and 2044M25P04 and later with prior approved software is permitted. Refer to CFM-SB 73-0115 for the reverse thrust idle changes.

*[3] EEC software 1853M78P31 (FADEC2) and 2044M25P12 (FADEC3) and later include stall margin software improvements. Intermix of this software and an earlier version will cause transient asymmetric thrust differences due to different acceleration/deceleration rates at altitude.

*[4] FMC-MEDB software BCG-014-A2, BCG-014-V9, BCG-016-F9, BCG-016-D0, BCG-016-G1, BCG-01J-05, BCG-01P-B6, or BCG-01T-A0 is necessary. See the FMC-MEDB table.

*[5] EEC software 1853M78P27 (FADEC2) and 2044M25P07 (FADEC3) and later include several operational differences with earlier versions. Intermix of these earlier versions with later versions is not permitted.

*[6] EEC software 2044M25P09 (FADEC3) or later is necessary for use with FADEC 3 hardware 2042M67P04 and 2042M16P04.

*[7] Engines equipped with EEC software part number 1853M78P33, 1853M78P34,1853M78P35 (FADEC 2) and 2044M25P14, 2044M25P15, 2044M25P16 (FADEC 3) may not be intermixed with an engine with an earlier software version due to modifications to the “Bodie” stall protection logic. Intermix within the software versions listed in this note is permitted.

*[8] Engines equipped with EEC software part number 2044M25P17 (FADEC 3), 2044M25P18 (FADEC 3), 2044M25P19 (FADEC 3), 2044M25P20 (FADEC 3), 1853M78P37 (FADEC 2 SAC), 1853M78P36 (FADEC 2 DAC), 1853M78P38 (FADEC 2 SAC), 1853M78P39 (FADEC 2 SAC) or 1853M78P40 (FADEC 2) may not be intermixed with an engine with an earlier software version due to modifications to the “Bodie” stall protection logic.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F. EEC Software Load

SUBTASK 73-21-60-560-001-F00

CAUTION

YOU MUST TRANSFER PROGRAMS FROM THE CD-ROM TO THE FLOPPY DISK FOR OPERATION IN THE ARINC-615 DATA LOADER. IF NOT, YOU CAN USE THE EXTERNAL CD-ROM DRIVE WITH THE PMAT OR LOAD THE SOFTWARE DIRECTLY TO THE PMAT HARD DRIVE. IF YOU DO NOT, DAMAGE CAN OCCUR.

IDC ALL PRE SB 737-CFM56-7B-73-0219

CAUTION

DURING THE STEPS THAT REPROGRAM THE EEC, THE DATA LOADER WILL WRITE FOUR (FOR FADEC 2) OR TWO (FOR FADEC 3) NVM FILES TO THE WORKING FLOPPY DISK, OR TO THE PMAT HARD DRIVE. IF YOU WANT TO SAVE THESE NVM FILES, YOU MUST USE A DIFFERENT WORKING COPY FOR EACH EEC THAT YOU PROGRAM.

IDC ALL

(1) To transfer the media to the necessary location, do these steps:

(a) If Working Copy Floppy Disks are necessary to transfer the media, follow the instructions included in the CD-ROM file entitled “Procedures for Making Working Copy Disks” to create one working copy disk for each engine that will be reprogrammed.

IDC ALL PRE SB 737-CFM56-7B-73-0219

1) A working copy for each engine is not necessary if you will not keep the NVM files.

IDC ALL

(b) When you use a Demo Systems PMAT or equivalent, refer to the OEM data loader manufacturer operator's manual for instructions to transfer the media to the internal hard drive.

NOTE: The working copy floppy disks must not be Write Protected.

(c) Follow the instructions included in the CD-ROM file to make labels for each new disk. All the necessary files are included on the CD-ROM.

NOTE: The EEC part number, the EEC serial number and the Engine serial number should be filled in when you use the working floppy disk.

SUBTASK 73-21-60-740-002-F00

(2) Look for system faults before you program the EEC, do this task: EEC BITE TEST - FAULT HISTORY, TASK 73-21-00-740-801-F00.

NOTE: It is recommended that you look for any EEC System faults before you reprogram the EEC.

SUBTASK 73-21-60-840-003-F00

(3) To isolate the applicable EEC, do these steps:

(a) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 73-21-60-480-001-F00

(4) To connect the ARINC-615 data loader, do these steps (Figure 201 or Figure 202):

(a) Disconnect the identification plug from the EEC receptacle, P11.

NOTE: The identification plug is connected to the EEC receptacle, P11.

(b) Install a protective cover on the identification plug.

(c) When you use a Sundstrand or Demo Systems PDL or equivalent, do these steps:

1) Disconnect the DP0202 electrical connector from the EEC receptacle, J2.

NOTE: The DP0202 connector is connected to the EEC J2 receptacle.

2) Connect the PDL adapter cable to the PDL receptacle, J1.

3) Connect the PDL adapter cable to the EEC adapter cable, J1A.

4) Before you connect the EEC adapter cable to the FADEC, touch the connector-coupling nut of the EEC adapter cable connector, P2A to the connector-coupling nut of electrical connector, DP1010 and hold for one (1) second to dissipate any potential electrical charge in the PDL.

5) Connect the EEC adapter cable connector, J2A to the disconnected electrical connector, DP0202 on the wire harness.

6) Connect the EEC adapter cable connector, P2A to the EEC receptacle, J2.

7) Connect the EEC adapter cable connector, J11 to the EEC receptacle, P11.

(d) When you use a Demo Systems PMAT or equivalent, do these steps:

1) Connect the PMAT adapter cable connector, P1 to the PMAT 2000 receptacle, J1.

2) Before you connect the adapter cable to the FADEC, touch the connector-coupling nut of the PMAT adapter cable (#80046–1) or equivalent to the connector-coupling nut of electrical connector, DP1010 and hold for one (1) second to dissipate any potential electrical charge in the PMAT.

3) Connect the PMAT adapter cable connector, J11 to the EEC receptacle, P11.

4) Refer to the OEM data loader manufacturer's instructions to prepare the data loader for reprogramming of the EEC.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-60-470-001-F00

(5) To reprogram the EEC, do these steps:

NOTE: If the steps below are not done in the order they are given, the software could load incorrectly.

NOTE: For the PDL type data loader only, if the steps listed below to put the Working Copy disc into the Portable Data Load are not completed within 5 minutes, then you must open the circuit breakers listed and start the task again.

(a) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Set the Engine Start Switch (P5) in the CONT position.

NOTE: This will apply power to the two channels of the EEC.

(d) When you use a Demo Systems PDL or equivalent, do these steps:

1) Turn the PDL on.
2) Make sure that the WORKING COPY disc is not write protected.
3) Insert the WORKING COPY disc into the PDL.
   a) The PDL will automatically install the operating system into the EEC.
   b) If the software load is successful, the PDL will show its load completed message in 35 to 50 minutes.
   c) If the software load is not successful, the PDL will show its fail message in 35 to 50 minutes.

Table 203/73-21-60-993-809-F00

DEMO PDL MESSAGES		SUNDSTRAND PDL MESSAGES
LOAD COMPLETE	----	COMP (GREEN LIGHT)
TRANSFER FAIL	----	XFER (RED LIGHT)
READ/WRITE FAIL	----	R/W (RED LIGHT)

(e) When you use a Demo Systems PMAT or equivalent, do these steps:

1) The PMAT will automatically install the operating system on the EEC after the Engine Start Switch (P5) is put in the CONT position. This process will take approximately 30-50 minutes.

   NOTE: For the PMAT type data loader only, if the process does not start in five (5) minutes, then you must open the circuit breakers listed above and start the task again.

2) The PMAT will display whether the load was complete or not successful at the end of this time.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-60-210-001-F00

(6) If the software load is not successful, do these steps:

(a) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) When you use a Demo Systems PDL or equivalent, do these steps:

1) Make sure that the cables between the PDL and the EEC are correctly installed.
2) Make sure that all cable connections are tightened to the proper torque.
3) Check to make sure that the floppy disk is not write protected.
4) Make sure that the PDL is powered up before you install the floppy.
5) Do the procedure again a maximum of three times before a repair action is necessary.

(d) When you use a Demo Systems PMAT or equivalent, do these steps:

1) Make sure that the cables between the PMAT and the EEC are correctly installed.
2) Make sure that all cable connections are tightened to the proper torque.
3) Make sure that the PMAT is ready to download before you do the procedure again.
4) Do the procedure again a maximum of three times before a repair action is necessary.

SUBTASK 73-21-60-210-002-F00

(7) If the software load is successful, do these steps:

(a) Only when you use the Demo Systems PDL or equivalent, you must first remove the WORKING COPY disc from the PDL and then turn off the power to the PDL.

(b) Set the Engine Start Switch (P5) in the OFF position.

(c) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(d) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(e) When you use a Demo Systems PDL or equivalent, do these steps:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Disconnect the EEC adapter cable connector, J11 from the EEC receptacle, P11.
2) Disconnect the PDL adapter cable connector, P1 from the PDL receptacle, J1.
3) Disconnect the EEC adapter cable connector, P2A from the EEC receptacle, J2.
4) Disconnect the EEC adapter cable connector, J2A from the electrical connector, DP0202 on the wire harness.
5) Connect the DP0202 electrical connector to the EEC receptacle, J2.
6) Connect the identification plug to the EEC receptacle, P11.

(f) When you use a Demo Systems PMAT or equivalent, do these steps:
1) Disconnect the PMAT adapter cable connector, J11 from the EEC receptacle, P11.
2) Disconnect the PMAT adapter cable connector, P1 from the PMAT receptacle, J1.
3) Connect the identification plug to the EEC receptacle, P11.

(g) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(h) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(i) Do this task: IDENT/CONFIG, TASK 73-21-00-700-808-F00.
1) Make sure that the correct EEC software part number and version number shows during the test.
2) Enter the engine serial number.

(j) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

SUBTASK 73-21-60-910-001-F00

(8) To identify the new software on the EEC Software Identification Plate, do these steps (Figure 201 or Figure 202):

NOTE: The EEC Software Identification Plate is a metallic sticker that is found on the EEC.

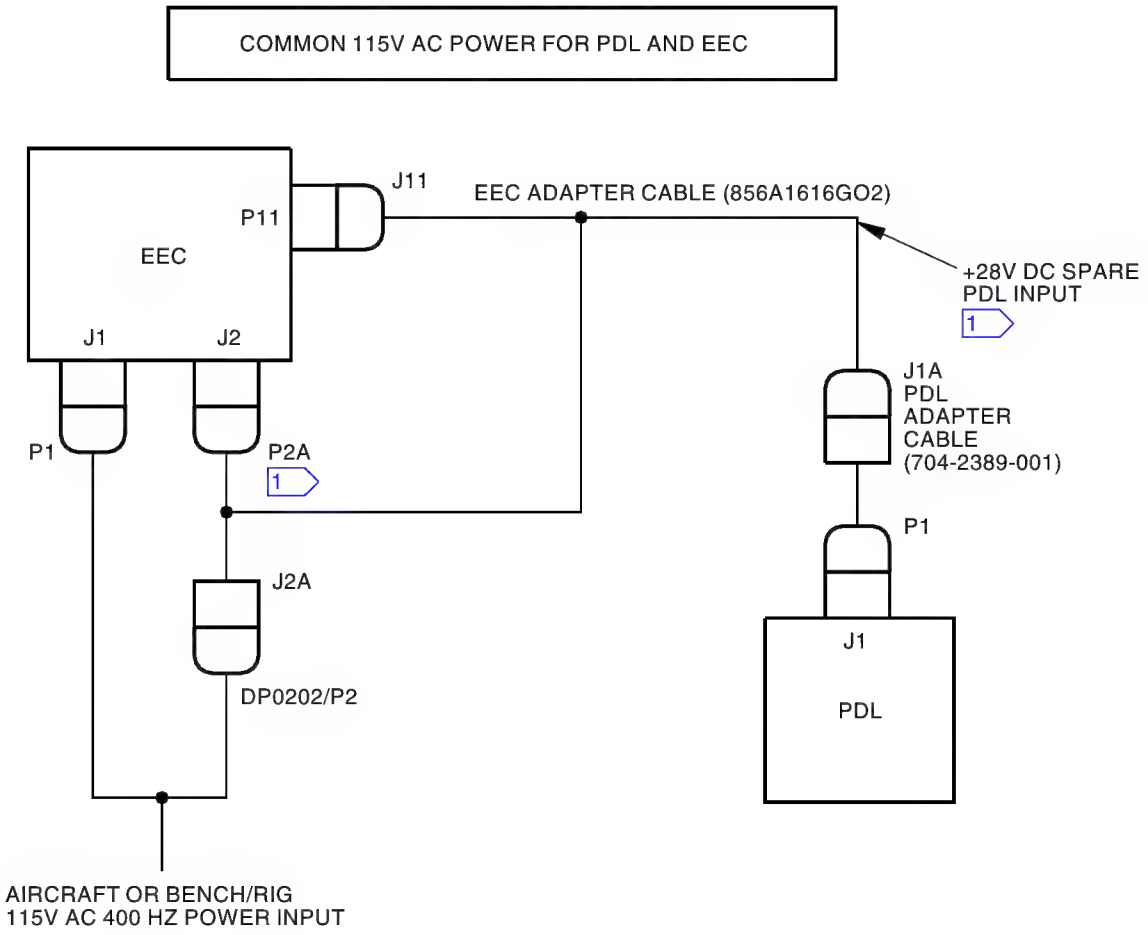
(a) Use a ball point pen to cross out the old S/W part number.
1) Make sure that you can still read the old part number after it has been crossed out.

(b) Use a ball point pen to install the new S/W part number on the identification plate.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

EEC - PDL INTERFACE OPTION 1



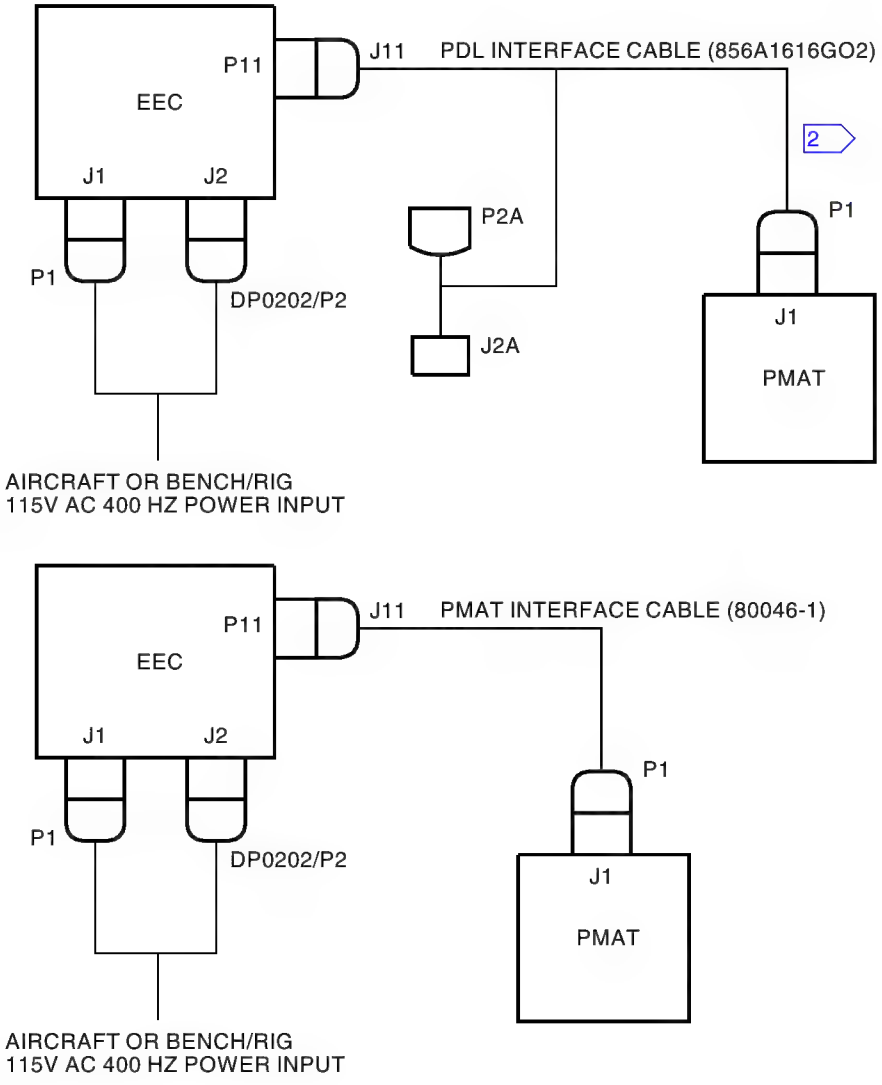
1 THE +28V DC SPARE PDL INPUT SHOWN ABOVE CAN BE USED TO POWER THE PDL INSTEAD OF THE EEC P2/J2 CONNECTION.

1142632-00
H84256 S0006582862_V3

EEC Interface (PDL/PMAT Adapter Cable)
Figure 201/73-21-60-990-803-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

EEC - PMAT INTERFACE CONNECTION OPTIONS



2 THE PMAT HAS IT'S OWN POWER SUPPLY. THE PMAT CAN USE THE PDL INTERFACE CABLE 856A1616G02 AS AN ALTERNATE METHOD OF CONNECTION TO THE EEC.

1247640-00
U65785 S0000212031_V2

EEC Interface (PDL/PMAT Adapter Cable)
Figure 201/73-21-60-990-803-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

INSTALLED SOFTWARE IDENTIFICATION	
SOFTWARE PART NO.	VERSION REFERENCE
~~1853M78P01~~	~~7.B.C (7C02)~~
~~1853M78P02~~	~~7.B.D (7C04)~~
~~1853M78P03~~	~~7.B.E (7B25)~~
1853M78P04	7.B.F (7B2B)

M16498 S0006582863_V2

Installed Software Identification (Example)
Figure 202/73-21-60-990-810-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-60-970-801-F00

3. Retrieve NVM

A. General

(1) These tools are necessary when you retrieve NVM data from the EEC:

(a) ARINC 615 data loader, COM-261, CFMI recommends a Sundstrand, Demo Systems PDL, Demo Systems PMAT 2000 or equivalent.

(b) CFMI PDL (interface) adapter cable, part number 856A1616G02 or Demo Systems PMAT (interface) adapter cable, part number 80046-1 or EEC adapter cable, COM-11091, or equivalent.

(2) This task refers to the PDL Procedure for the Portable Data Loader procedure. This task refers to the PMAT 2000 Procedure for the Portable Maintenance Access Terminal procedure.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
73-21-00-740-801-F00	EEC BITE TEST - FAULT HISTORY (P/B 501)
73-21-61-000-801-F00	Identification Plug Removal (P/B 401)
73-21-61-400-801-F00	Identification Plug Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-261	Data Loader - ARINC 615 Part #: 11615-50 Supplier: 0D4J3 Part #: AE-615-MPDL Supplier: CD624 Part #: CEI-715-DL-2 Supplier: 0BPH5 Part #: P2K-615A-06 Supplier: 0BAW0 Opt Part #: 11615-20 Supplier: 0D4J3 Opt Part #: 30100 Supplier: 0BAW0 Opt Part #: 80000-05 Supplier: 0BAW0 Opt Part #: 964-0400-020 Supplier: 97896 Opt Part #: 964-0400-025 Supplier: 97896 Opt Part #: 964-0400-030 Supplier: 97896 Opt Part #: 964-0400-055 Supplier: 97896 Opt Part #: 964-0400-060 Supplier: 97896 Opt Part #: 964-0400-064 Supplier: 97896 Opt Part #: 964-0400-065 Supplier: 97896
COM-11091	ADAPTER CABLE - EEC DATALOADING Part #: 110602003-00 Supplier: 0D4J3 Part #: 856A1616G02 Supplier: 07482

D. Location Zones

Zone	Area
414	Engine 1 - Fan Cowl, Right
424	Engine 2 - Fan Cowl, Right

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Procedure

SUBTASK 73-21-60-970-001-F00

CAUTION

YOU MUST MAKE WORKING COPIES OF THE MASTER FLOPPY DISK OR CD-ROM. DO NOT USE THE MASTER FLOPPY DISK TO RETRIEVE THE NVM DATA FROM THE EEC. DURING THE STEPS THAT RETRIEVE THE NVM DATA FROM THE EEC, THE DATA LOADER WILL WRITE TWO NVM FILES TO THE WORKING FLOPPY DISK. IF YOU WANT TO SAVE THE TWO NVM FILES, YOU MUST USE A DIFFERENT WORKING COPY FOR EACH EEC NVM THAT YOU RETRIEVE.

CAUTION

YOU MUST USE A FLOPPY DISK IDENTIFIED AS “RETRIEVE ONLY DATA” FOR USE IN THE AIRINC-615 DATA LOADER, OR RETRIEVE THE NVM DATA DIRECTLY TO THE PMAT HARD DRIVE. DURING THE STEPS TO RETRIEVE THE NVM DATA FROM THE EEC, THE DATA LOADER/PMAT WILL WRITE FOUR (FOR FADEC 2) OR TWO (FOR FADEC 3) NVM FILES TO THE FLOPPY DISK, OR TO THE PMAT HARD DRIVE. IF YOU WANT TO SAVE THE NVM FILES FOR BOTH EEC'S TO A FLOPPY DISK, YOU MUST USE A DIFFERENT FLOPPY DISK FOR EACH EEC/ENGINE.

CAUTION

THE FLOPPY DISKS MUST NOT BE WRITE PROTECTED. THE NVM DATA WILL NOT TRANSFER IF THE DISKS ARE WRITE PROTECTED.

(1) PDL Procedure;

Do these steps to prepare the floppy disk.

(a) Get a 3.5-inch floppy disk that is formatted for PC applications.

(b) Get the CD-ROM that came with the Engine for the EEC.

(c) Use the CD-ROM instructions “Procedure for Making Working Copy Disks” to create a working copy for each EEC.

(d) Install labels on each floppy disk. Make sure the labels say Retrieve Only Data.

(e) If it is necessary, mark the EEC part number, the EEC serial number, and the Engine serial number one each floppy disk label.

NOTE: The EEC part number, the EEC serial number, and the Engine serial number should be filled in when the working floppy disk is used.

SUBTASK 73-21-60-970-003-F00

(2) PMAT 2000 Procedure;

Do these steps to prepare the PMAT:

(a) Refer to manufacturer operator's manual for instructions to retrieve NVM data to the internal hard drive

(b) If you use a floppy disk and the PMAT, use the instructions in the previous task to prepare the floppy disks

SUBTASK 73-21-60-740-001-F00

(3) Look for any system faults before you retrieve the NVM data from the EEC. Do this task, EEC BITE TEST - FAULT HISTORY, TASK 73-21-00-740-801-F00.

NOTE: It is recommended that you look for any EEC system faults before you retrieve the NVM data from the EEC.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-60-860-005-F00

(4) Do these steps to isolate the applicable EEC:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-60-010-001-F00

(5) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 73-21-60-480-002-F00

(6) PDL Procedure;

Do these steps to connect the PDL to the EEC (Figure 201 or Figure 202):

(a) Do this task: Identification Plug Removal, TASK 73-21-61-000-801-F00.

NOTE: The ID plug is connected to the EEC receptacle, P11.

(b) Disconnect the DP0202 electrical connector from the EEC.

NOTE: The DP0202 electrical connector is connected to the EEC J2 receptacle.

(c) Connect the PDL adapter cable connector, J2A to the electrical connector DP0202/P2.

(d) Connect the PDL adapter cable connector, P2A to the EEC receptacle, J2.

(e) Connect the PDL adapter cable connector, P1 to the PDL, receptacle J1.

(f) Connect the PDL adapter cable connector, J11 to the EEC receptacle, P11.

SUBTASK 73-21-60-480-003-F00

(7) PMAT 2000 Procedure;

Do these steps to connect the PMAT to the EEC (Figure 201 or Figure 202):

(a) Do this task: Identification Plug Removal, TASK 73-21-61-000-801-F00.

NOTE: The ID plug is connected to the EEC receptacle, P11.

(b) Connect the PMAT adapter cable to the receptacle on the PMAT.

(c) Before you connect the PMAT adapter cable to the EEC, touch the coupling nut of the adapter cable to the coupling nut of the connector DP1010.

(d) Hold the adapter coupling nut to the connector DP1010 for one second and dissipate any potential electrical charge

(e) Connect the PMAT adapter cable connector, J11 to the EEC receptacle, P11.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(f) Refer to manufacturer operator's manual for instructions to prepare the data loader for retrieval of NVM data from the EEC.

SUBTASK 73-21-60-970-002-F00

CAUTION DO THE STEPS THAT FOLLOW IN THE SEQUENCE THAT THEY ARE GIVEN. IF YOU DO NOT DO THE STEPS IN THE CORRECT SEQUENCE, THE NVM DATA CAN NOT BE RETRIEVED.

CAUTION PDL PROCEDURE, COMPLETE THE STEPS THAT FOLLOW TO INSERT THE FLOPPY DISK INTO THE PDL IN NOT MORE THAN FIVE MINUTES. IF YOU DO NOT INSERT THE RETRIEVE-ONLY DISK INTO THE PDL IN FIVE MINUTES, THEN YOU MUST OPEN THE CIRCUIT BREAKERS AND START THE TASK AGAIN.

(8) Do these steps to retrieve the NVM data from the EEC:

(a) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Set the Engine Start Switch (P5) in the CONT position.

NOTE: This will apply power to the two channels of the EEC.

(d) PDL Procedure;

Do these steps:

1) Turn on the PDL.
2) Make sure the floppy disk is not write protected.
3) Put the floppy disk into the PDL.
   a) The PDL will automatically retrieve the NVM data from the EEC.
   b) If the NVM is retrieved successfully, the PDL will show its load complete message in less than five minutes (Table 204).
   c) If the NVM retrieve is not successful, the PDL will show its fail message in less than five minutes (Table 204).

Table 204/73-21-60-993-808-F00

DEMO PDL MESSAGES	SUNDSTRAND PDL MESSAGES
LOAD COMPLETE	COMP (GREEN LIGHT)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 204/73-21-60-993-808-F00 (Continued)

DEMO PDL MESSAGES	SUNDSTRAND PDL MESSAGES
TRANSFER FAIL	XFER (RED LIGHT)
READ/WRITE FAIL	R/W (RED LIGHT)

(e) PMAT 2000 Procedure;

Do these steps:

NOTE: If the process does not start in five minutes, then you must open the circuit breakers listed above and start the task again.

1) The PMAT will automatically retrieve the NVM data from the EEC after the engine start switch is put in the CONT position. This process will take less than five minutes.

2) The PMAT will display whether the NVM data retrieval was complete or unsuccessful in less than five minutes.

SUBTASK 73-21-60-860-006-F00

(9) If the NVM data is not retrieved successfully, then do these steps:

(a) Set the Engine Start Switch (P5) in the OFF (or AUTO) position.

(b) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(c) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(d) PDL Procedure;

Do these steps:

1) Make sure that the cables between the PDL and the EEC are correctly installed.

2) Make sure all the cable connections are tightened to the correct torque.

3) Make sure the floppy disk is not write protected.

4) Make sure the PDL is powered up before you put the floppy disk in.

5) Do the procedure again a maximum of three times before a repair action is necessary.

(e) PMAT 2000 Procedure;

Do these steps:

1) Make sure that the cable between the PMAT and the EEC is correctly installed.

2) Make sure all the cable connections are tightened to the correct torque.

3) Make sure the PMAT is ready to download before you do the procedure again.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

4) Do the procedure again a maximum of three times before a repair action is necessary.

SUBTASK 73-21-60-080-001-F00

(10) If the NVM data was retrieved successfully, then do these steps:

(a) PDL Procedure;

Remove the floppy disk from the PDL and remove power to the PDL.:

(b) Set the Engine Start Switch (P5) in the OFF (or AUTO) position.

(c) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(d) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(e) PDL Procedure;

Disconnect the PDL from the EEC.

1) Disconnect the PDL adapter cable from the EEC receptacle, P11.
2) Disconnect the PDL adapter cable from the PDL receptacle, J1.
3) Disconnect the PDL adapter cable connector, P2A from the EEC receptacle, J2.
4) Disconnect the PDL adapter cable connector, J2A from the connector, DP020 on the wire harness.
5) Connect the DP0202 electrical connector to the EEC receptacle, J2.

(f) PMAT 2000 Procedure;

Disconnect the PMAT from the EEC.

1) Disconnect the PMAT adapter cable from the EEC receptacle, P11.
2) Disconnect the PMAT adapter cable from the PMAT receptacle, J1.
3) Connect the DP0202 electrical connector to the EEC receptacle, J2.

(g) Do this task: Identification Plug Installation, TASK 73-21-61-400-801-F00.

SUBTASK 73-21-60-860-007-F00

(11) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(Continued)

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 73-21-60-860-008-F00

(12) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

ELECTRONIC ENGINE CONTROL - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks:

(1) The removal of the electronic engine control (EEC)

(2) The installation of the electronic engine control (EEC).

TASK 73-21-60-000-801-F00

2. EEC Removal

(Figure 401)

A. General

(1) The electronic engine control (EEC) is on the right side of the fan case at the 2:00 o'clock position.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Procedure

SUBTASK 73-21-60-840-001-F00

(1) Do these steps to isolate the applicable EEC:

(a) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

(c) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Remove the EEC

SUBTASK 73-21-60-020-001-F00

CAUTION MAKE SURE TO FOLLOW THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EEC.

(1) Do these steps to remove the EEC [1]:

IDC ALL PRE SB 737-CFM56-7B-73-0006

(a) Remove the four bolts [3] to disconnect the EEC cooling tube [2] and plate [21] from the EEC [1].

IDC ALL POST SB 737-CFM56-7B-73-0006

(b) Remove the four bolts [3] to disconnect the EEC cooling tube [2] from the EEC [1].

IDC ALL

(c) Disconnect these electrical harnesses from the EEC [1]:

1) The MW0301 (J1) [15]
2) The MW0303 (J3) [12]
3) The MW0304 (J4) [10]
4) The MW0302 (J2) [8]
5) The J7 [14]
6) The J5 [13]
7) The J6 [11]
8) The J8 [9]
9) The J9 [7]
10) The J10 [6]
11) The identification plug (P-11) [5].

NOTE: The identification plug will stay attached to the engine.

(d) Install the protective covers on the electrical connectors and the EEC receptacles.

CAUTION MAKE SURE THAT YOU USE TWO WRENCHES TO LOOSEN TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE FITTING. USE THE OTHER WRENCH TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(e) Disconnect the PS3 [20] air tube from the EEC [1].

(f) Do these steps to remove the EEC from the fan case:

1) Loosen the bolts [4] that hold the EEC to the fan case brackets.

NOTE: The EEC bonding jumper is connected to the EEC attachment bolt head and will be removed with the EEC.

NOTE: The bolts are captive in the bushings of the EEC.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

WARNING BE CAREFUL WHEN YOU LIFT THE EEC. THE EEC WEIGHS 45LB (20.5KG). IF NECESSARY, USE TWO PERSONS TO COMPLETE THIS PROCEDURE. IT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

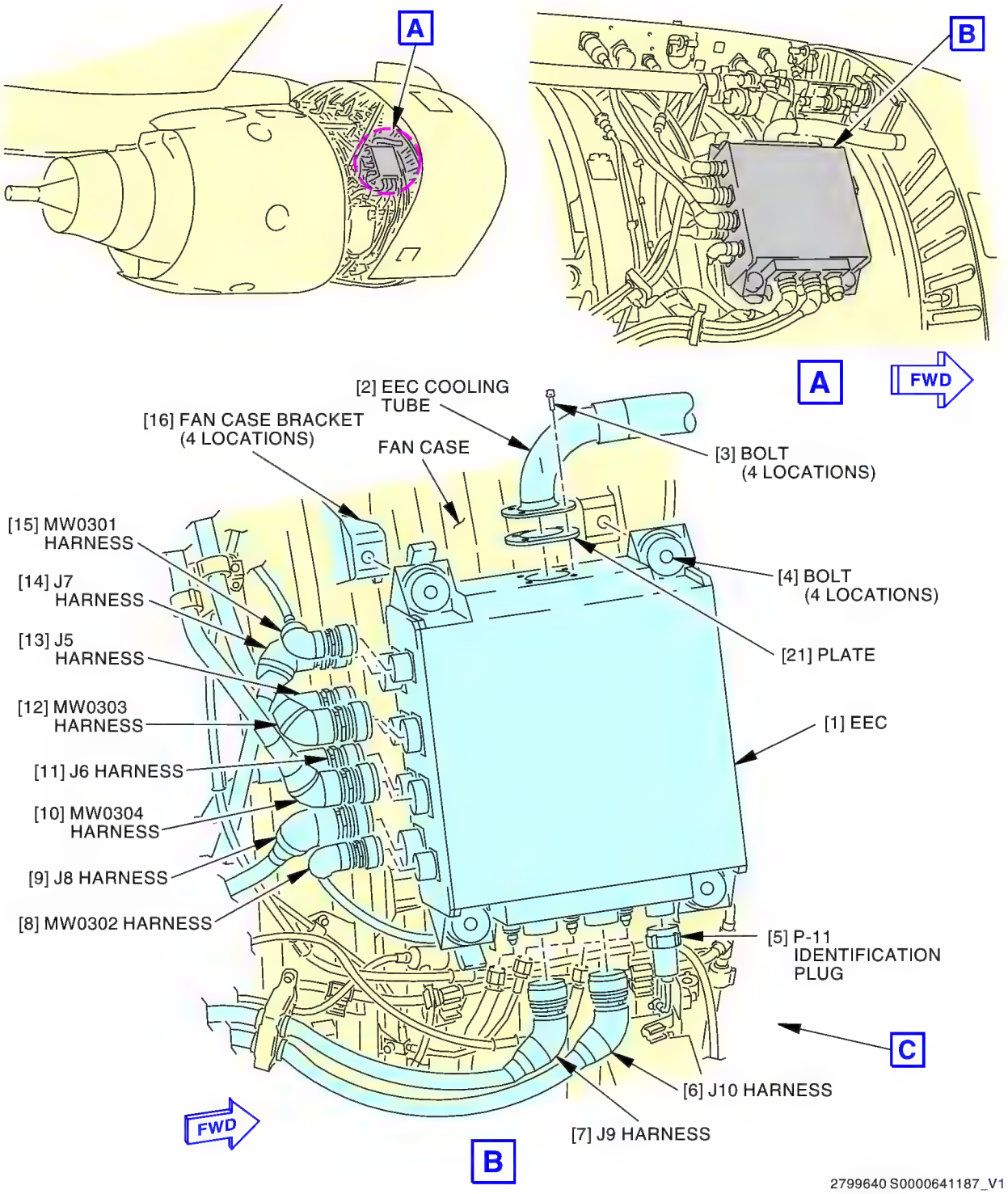
2) Remove the EEC [1].

(g) Install protective covers on the air tubes and the tube connections of the EEC [1].

(h) Put a protective cover over the cooling tube opening in the EEC [1].

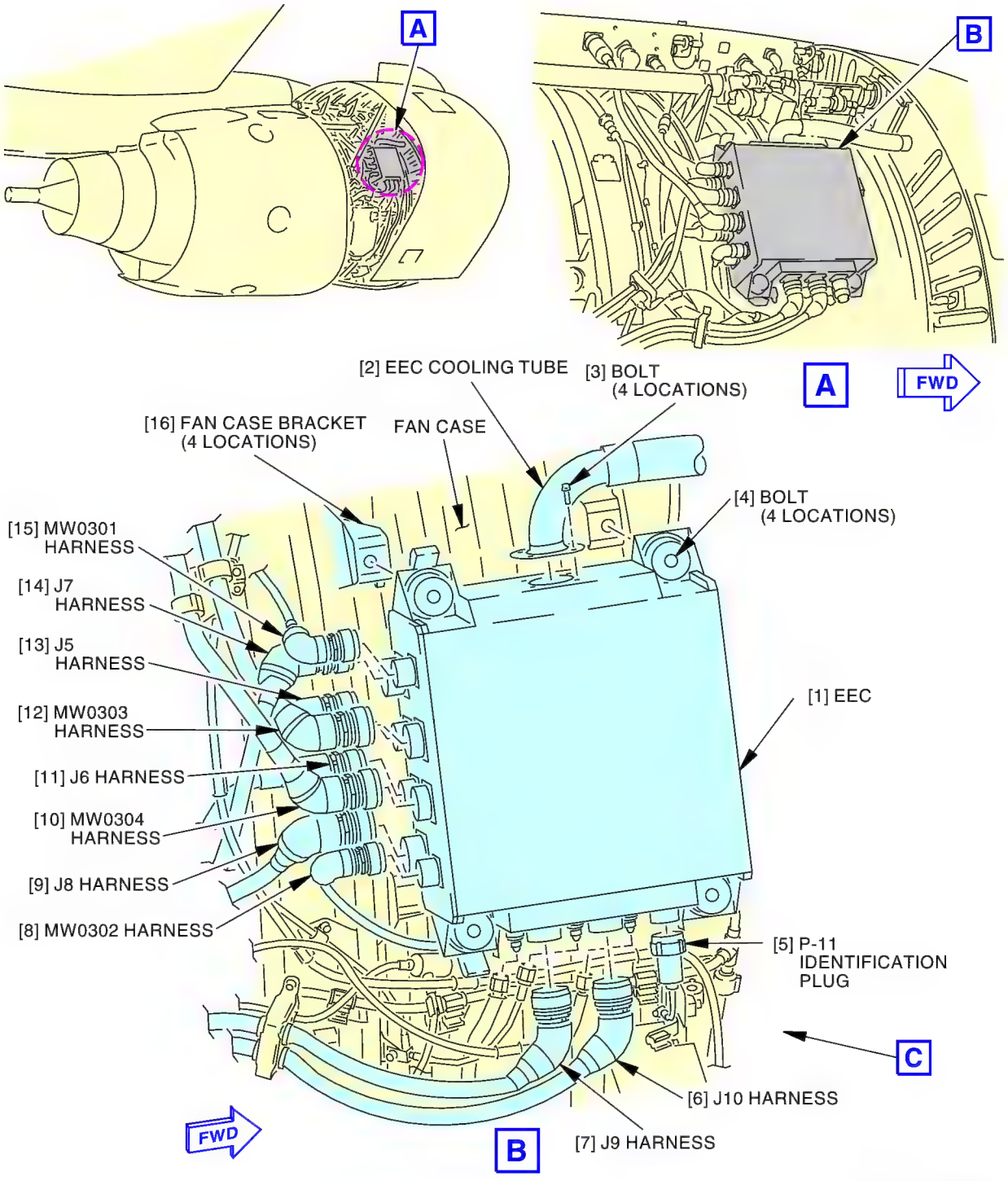
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Electronic Engine Control Installation
Figure 401/73-21-60-990-801-F00 (Sheet 1 of 3)

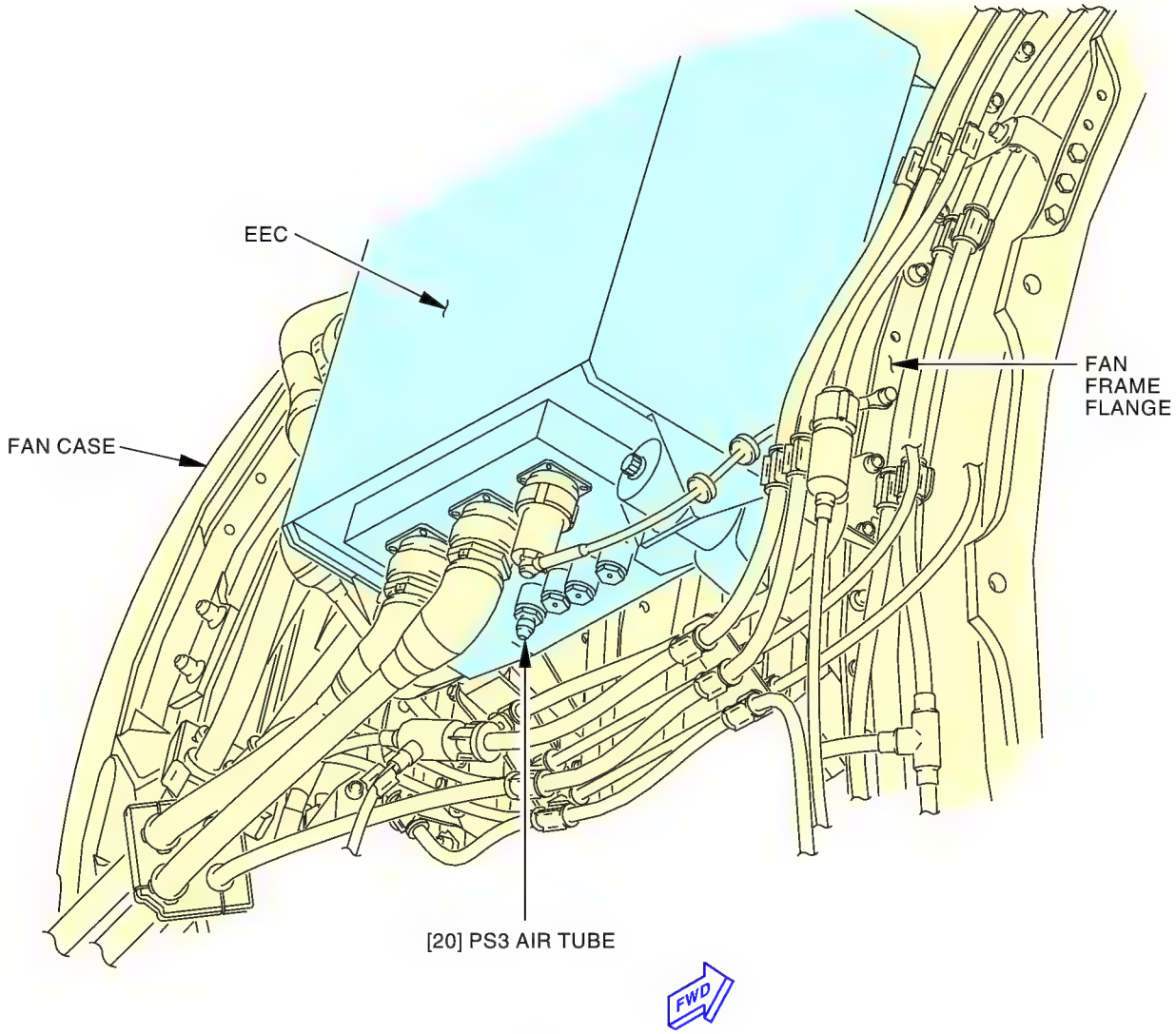
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



F30212 S0006582869_V2

Electronic Engine Control Installation
Figure 401/73-21-60-990-801-F00 (Sheet 2 of 3)

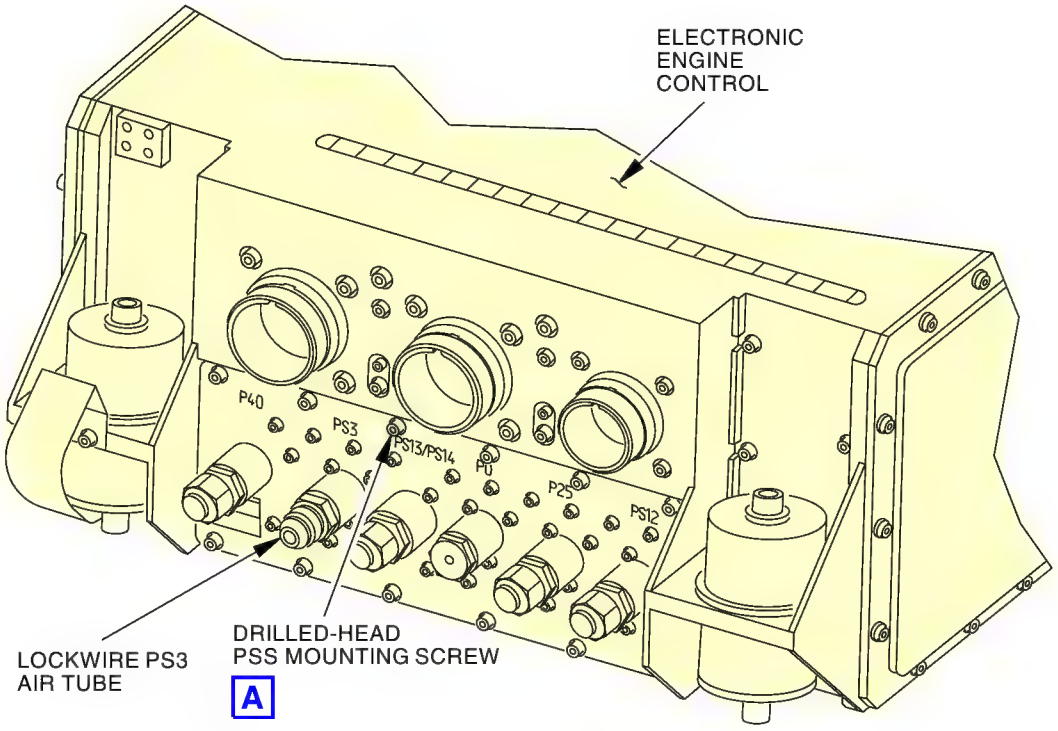
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

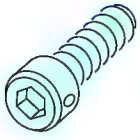


F72620 S0006582870_V3

Electronic Engine Control Installation
Figure 401/73-21-60-990-801-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details





DRILLED-HEAD
PSS MOUNTING SCREW

A

1219692-00-A
433878 S0000140868_V2

PS3 Air Tube Lockwire Installation
Figure 402/73-21-60-990-805-F01

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-60-400-801-F00

3. EEC Installation

(Figure 401)

A. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	EEC	73-21-60-01A-070	IDC 007-010, 012-999
		73-21-60-01A-080	IDC 007-010, 012-999
		73-21-60-03-075	IDC 001-006
		73-21-60-03-080	IDC 001-006

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Procedure

SUBTASK 73-21-60-420-001-F00

CAUTION MAKE SURE TO FOLLOW THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EEC.

(1) Do these steps to install the EEC [1]:

(a) Do these steps to install the EEC on the fan case:

1) Apply graphite mineral vaseline, D00601 [CP2101] to the threads of the bolts [4].

WARNING BE CAREFUL WHEN YOU LIFT THE EEC. THE EEC WEIGHS 45LB (20.5KG). IF NECESSARY, USE TWO PERSONS TO COMPLETE THIS PROCEDURE. IT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

2) Use the bolts [4] to connect the EEC [1] to the fan case brackets.

a) Tighten the bolts [4] to 210 ±20 in-lb (24 ±3 N·m).

(b) Remove the protective covers from the air tubes and tube connectors on the EEC [1].

(c) Connect the PS3 air tube [20] air tube to the EEC [1].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE MATING PART, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND MATING PART CAN OCCUR.

1) Do these steps to tighten the PS3 air tube [20] air tube coupling:
   a) Tighten the PS3 air tube [20] air tube coupling to 285 ±15 in-lb (32 ±2 N·m).
   b) Loosen the PS3 air tube [20] coupling.
   c) Retighten the PS3 air tube [20] coupling to 285 ±15 in-lb (32 ±2 N·m).
   d) Loosen the PS3 air tube [20].
   e) Retighten the PS3 air tube [20] coupling to 285 ±15 in-lb (32 ±2 N·m).
   f) ENGINES POST-CFM-SB 73-062;

      Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the PS3 air tube [20] to the screw on the EEC.

(d) Remove the protective covers from the electrical connectors and the EEC receptacles.

(e) Connect these electrical harnesses to the EEC [1]:
   1) The J8 harness [9]
   2) The J6 harness [11]
   3) The J5 harness [13]
   4) The J7 harness [14]
   5) The MW0302 harness [8]
   6) The MW0304 harness [10]
   7) The MW0303 harness [12]
   8) The MW0301 harness [15]
   9) The J9 harness [7]
   10) The J10 harness [6]
   11) The P-11 identification plug [5]

      NOTE: The identification plug is attached to the engine.

   12) Tighten the coupling rings on the electrical connectors with your hand until the electrical connector is correctly seated.

(f) Connect the EEC cooling tube [2] to the EEC [1]:
   1) Remove the protective covers from the connectors for the cooling tube.
   2) Apply graphite mineral vaseline, D00601 [CP2101] to the threads of the bolts [3].

IDC ALL PRE SB 737-CFM56-7B-73-0006

   3) Use the four bolts [3] to connect the EEC cooling tube [2] and plate [21] to the EEC [1].

IDC ALL POST SB 737-CFM56-7B-73-0006

   4) Use the four bolts [3] to connect the EEC cooling tube [2] to the EEC [1].

IDC ALL

   5) Tighten the four bolt [3] between 50 in-lb (5.65 N·m) to 55 in-lb (6.21 N·m).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F. EEC Installation Test

SUBTASK 73-21-60-860-003-F00

(1) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 73-21-60-860-004-F00

(2) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-60-710-001-F00

(3) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

(a) Make sure that the software version of the installed EEC is compatible with the opposite engine and airplane.

SUBTASK 73-21-60-730-002-F00

(4) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDENTIFICATION PLUG - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the identification plug

(2) The installation of the identification plug.

TASK 73-21-61-000-801-F00

2. Identification Plug Removal

(Figure 401)

A. General

(1) The engine has one identification plug that is connected to the EEC.

(2) For the instructions to change the engine thrust rating using the Standard ID plug, refer to CFM Service Bulletin 72-003 for the selection of the applicable identification plug configuration.

(3) For the instructions to change the engine thrust rating using the Reconfigurable Hybrid ID plug, refer to CFM Service Bulletin 72-106 for the selection of the applicable identification plug configuration.

(4) For the instructions to change the airplane engine thrust rating, refer to the applicable airplane service bulletin.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-21-61-840-001-F00

(1) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 73-21-61-840-002-F00

(2) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-61-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

E. Identification Plug Removal

SUBTASK 73-21-61-020-001-F00

(1) Do these steps to remove the identification plug:

(a) Disconnect the engine assembly [1] (identification plug) from the EEC receptacle [2].

1) Install protective covers on the identification plug and the EEC receptacle.

(b) Remove the nut [7], the spacer [6], the washer [5], and the bolt [4] that hold the shielding braid [8] to the fan frame flange [3].

NOTE: The nut [7] is the Hi-Lock type. Refer to CFMI SPM 70-43-51/201 to remove the nut.

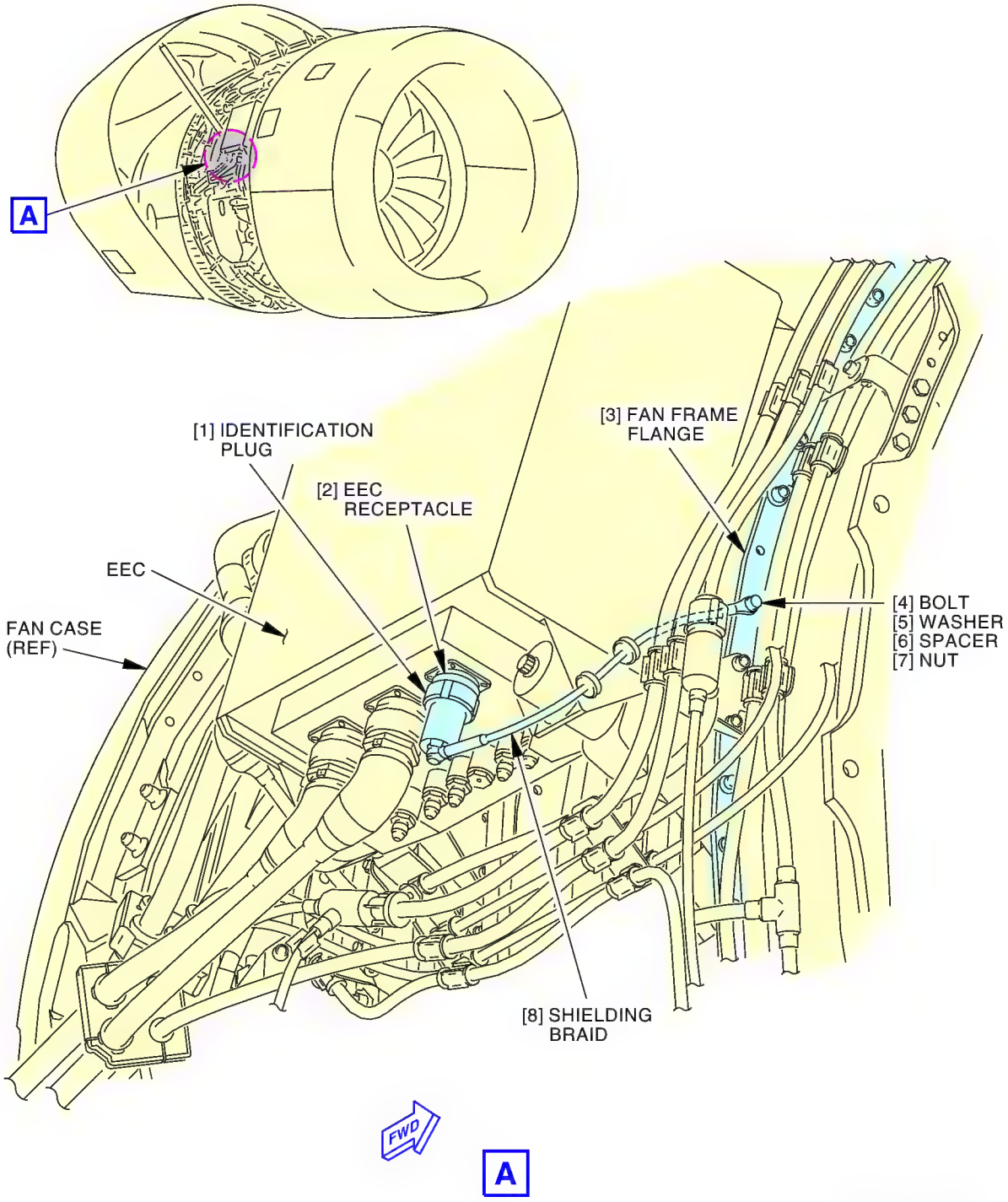
1) Discard the nut [7] and the bolt [4].

2) Keep the washer [5] and spacer [6] for the subsequent installation.

(c) Remove the identification plug [1].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



F32896 S0006582876_V2

Identification Plug Installation
Figure 401/73-21-61-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-61-400-801-F00

3. Identification Plug Installation

(Figure 401)

A. General

(1) For the instructions to change the engine thrust rating, refer to CFM Service Bulletin 72-003 or 72-106 for the selection of the applicable identification plug configuration.

(2) For the instructions to change the airplane engine thrust rating, refer to the applicable airplane service bulletin.

B. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Engine assembly	72-00-00-08-079	IDC 001-006
		72-00-00-08-080	IDC 001-006
		72-00-00-08-119	IDC 001-006
		72-00-00-08-120	IDC 001-006
		72-00-00-09-035	IDC 001-006
		72-00-00-09-079	IDC 001-006
		72-00-00-09-080	IDC 001-006
		72-00-00-09-140	IDC 001-006
		72-00-00-09-145	IDC 001-006
		72-00-00-09-180	IDC 001-006
		72-00-00-09A-096	IDC 019-021
		72-00-00-09A-097	IDC 019-021
		72-00-00-09A-115	IDC 019-021
		72-00-00-09A-120	IDC 019-021
		72-00-00-09A-135	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Identification Plug Installation

SUBTASK 73-21-61-420-001-F00

(1) Do these steps to install the identification plug:

(a) Connect the engine assembly [1] (identification plug) to the EEC receptacle [2].

(b) Use a new bolt [4], the washer [5], the spacer [6] and a new nut [7] to install the shielding braid [8] to the fan frame flange [3].

1) Tighten the nut [7].

NOTE: The nut [7] is the Hi-Lock type. Refer to CFMI SPM 70-43-51/201 to install the nut.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F. Identification Plug Installation Test

SUBTASK 73-21-61-410-002-F00

(1) Do these steps to prepare for the installation test:

(a) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

(b) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-61-720-001-F00

(2) Do the tests that are listed in the Power Plant Test Reference Table. (TASK 71-00-00-800-811-F00)

SUBTASK 73-21-61-410-004-F00

(3) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

IDENTIFICATION PLUG - ADJUSTMENT/TEST

1. General

A. This procedure contains one task for the proper configuration of the programmable inputs into the Identification Connector (Push-Pull design).

TASK 73-21-61-800-801-F00

2. Identification Plug Configuration

(Figure 501)

A. General

(1) The engine has one identification plug connected to the Electronic Engine Control (EEC).

(2) For programmable input parameters, push-pull pins are positioned to provide a configuration setup corresponding to a specific engine configuration. The input parameters are given below:

(a) The Engine Configuration:

- 7B SAC with BSV
- 7B SAC without BSV
- 7B SAC with BSV and with E-LPT hardware
- 7B SAC without BSV and with E-LPT hardware
- 7B DAC (/2)
- 7B Tech Insertion (/3)
- 7B Tech Insertion (/3) and with E-LPT hardware
- 7BE.

(b) The N1 modifier configuration: N1 TRIM level 0 to 7.

NOTE: This parameter is available on the engine nameplate.

(c) The PMUX option configuration: available or not available.

1) PMUX engine (3 hoses connected to the EEC) must read "Y"

2) Non-PMUX engine (1 hose connected to the EEC) must read "N".

(3) For the instructions to change the engine thrust rating, refer to CFM Service Bulletin 72-003 for the selection of the applicable identification plug.

(4) For the instructions to engrave the engine nameplate, refer to CFM Service Bulletin 72-010 for the accomplishment instructions.

B. References

Reference	Title
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-21-61-000-801-F00	Identification Plug Removal (P/B 401)
73-21-61-400-801-F00	Identification Plug Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-3936	Tweezers - straight, pointed tips, non-serrated
STD-6617	Equipment - Vibro-engraving

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

D. Consumable Materials

Reference	Description	Specification
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Location Zones

Zone	Area
414	Engine 1 - Fan Cowl, Right
424	Engine 2 - Fan Cowl, Right

F. Prepare for the Identification Plug Configuration

SUBTASK 73-21-61-020-002-F00

(1) Do this task: Identification Plug Removal, TASK 73-21-61-000-801-F00.

G. Programming of the Identification Plug

NOTE: To prevent contamination of the electrical contacts inside of the connector, do the procedure in a closed area.

NOTE: The configurations are defined by a specific setup of push-pull contacts. The push-pull pin has two catches corresponding to two contact positions: one in the "Push" position and one in the "Pull" position.

NOTE: A color band placed on each pin must be fully visible when the pin is in the pull position and fully masked when the pin is in the push position. An intermediate position can cause a bad configuration.

NOTE: A mechanical stop on the pin limits the travel of the pin.

SUBTASK 73-21-61-860-001-F00

(1) Do these steps to get access to the configurable inputs.

(a) Remove the blanking cap [1] located at the rear of the body [3] of the connector.

NOTE: Removal of the cap located on the rear of the identification connector requires the connector to be installed on its EEC receptacle or onto an antagonist connector receptacle (to be manufactured by the airline).

1) Cut the safety wire securing the body [3] to the blanking cap [1].

2) Unscrew the blanking cap [1] from the body [3] using soft-nose pliers.

(b) Check the O-ring [2] located on the body [3].

1) If the O-ring [2] is damaged, discard it and replace it with a new one.

(c) Pull the pins against their mechanical stop to the "Pull" position.

SUBTASK 73-21-61-860-002-F00

(2) Do these steps to program the engine configuration:

(a) Locate the applicable push-pull pins (View D, Figure 501).

(b) Put the applicable push-pull pins in the position below using straight point tweezers, STD-3936 (Table 501).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Table 501/73-21-61-993-804-F00

Engine Configuration	Pin No. 19 Eng Conf 7BE	Pin No. 20 BSV Conf	Pin No. 21 SAC/ DAC Conf	Pin No. 22 Eng Conf Parity	Pin No. 28 Eng Conf TISAC	Pin No. 30 Spare	Pin No. 31 Eng Conf E-LPT	Pin No. 36 Spare
7B SAC with BSV	Pull	Pull	Pull	Push	Pull	Pull	Pull	Pull
7B SAC without BSV	Pull	Push	Pull	Pull	Pull	Pull	Pull	Pull
7B SAC with BSV and with E-LPT hardware	Pull	Pull	Pull	Pull	Pull	Pull	Push	Pull
7B SAC without BSV and with E-LPT hardware	Pull	Push	Pull	Push	Pull	Pull	Push	Pull
7B DAC (/2)	Pull	Pull	Push	Pull	Pull	Pull	Pull	Pull
7B Tech Insertion (/3)	Pull	Push	Pull	Push	Push	Pull	Pull	Pull
7B Tech Insertion (/3) with E-LPT hardware	Pull	Push	Pull	Pull	Push	Pull	Push	Pull
7BE	Push	Push	Pull	Push	Pull	Pull	Pull	Pull

SUBTASK 73-21-61-860-003-F00

(3) Do these steps to program the N1 modifier configuration (N1 TRIM):

(a) Locate the affected push-pull pins (View D, Figure 501).

(b) Put the affected push-pull pins according to the configuration below using straight point tweezers, STD-3936 (Table 502).

Table 502/73-21-61-993-805-F00

Trim Level	Pin No. 37	Pin No. 46	Pin No. 47	Pin No. 54
Trim Level = 0	Pull	Pull	Push	Pull
Trim Level = 1	Pull	Pull	Pull	Push
Trim Level = 2	Push	Pull	Pull	Pull
Trim Level = 3	Push	Pull	Push	Push
Trim Level = 4	Pull	Push	Pull	Pull
Trim Level = 5	Pull	Push	Push	Push
Trim Level = 6	Push	Push	Push	Pull
Trim Level = 7	Push	Push	Pull	Push

SUBTASK 73-21-61-860-004-F00

(4) Do these steps to program the PMUX configuration:

(a) Locate the affected push-pull pins (View D, Figure 501).

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Put the affected push-pull pins according to the configuration below using straight point tweezers, STD-3936 (Table 503).

Table 503/73-21-61-993-806-F00

PMUX Configuration	Pin No. 27
Available	Pull
Not Available	Push

SUBTASK 73-21-61-420-002-F00

(5) Do these steps to close the access of the configurable inputs:

NOTE: The connector is installed on its EEC receptacle or onto an antagonist connector receptacle (to be manufactured by the airline).

(a) Install the blanking cap [1] at the rear of the body [3] of the connector.

(b) Screw the blanking cap [1] on the body [3] using soft-nose pliers.

H. Identification Plug Installation

SUBTASK 73-21-61-420-003-F00

(1) Do this task: Identification Plug Installation, TASK 73-21-61-400-801-F00.

SUBTASK 73-21-61-710-001-F00

(2) Do the test listed in the task to install the identification plug.

(a) If the test gives an incorrect result, do these steps:

1) Note the input parameters fault configuration.

2) Do the blanking cap [1] removal of this procedure.

3) Inspect the affected push-pull pins to make sure that the color band is visible for pins pulled, not visible for pins pushed and according to the determinated configuration.

4) If not, pull the pins of the defective configuration against their stop before you do the procedure again.

(b) If the test gives a correct result, secure the body [3] to the blanking cap [1] of the connector with, safety wire, G02345 [CP8001], or cable, G50065 [CP8006].

SUBTASK 73-21-61-930-001-F00

(3) Engrave the updated configuration data on to the engine nameplate.

NOTE: Initial production engine configuration will be the first data listed on the nameplate, until all lines on the nameplate have been filled and the nameplate is replaced. For record keeping purposes, retain removed nameplates.

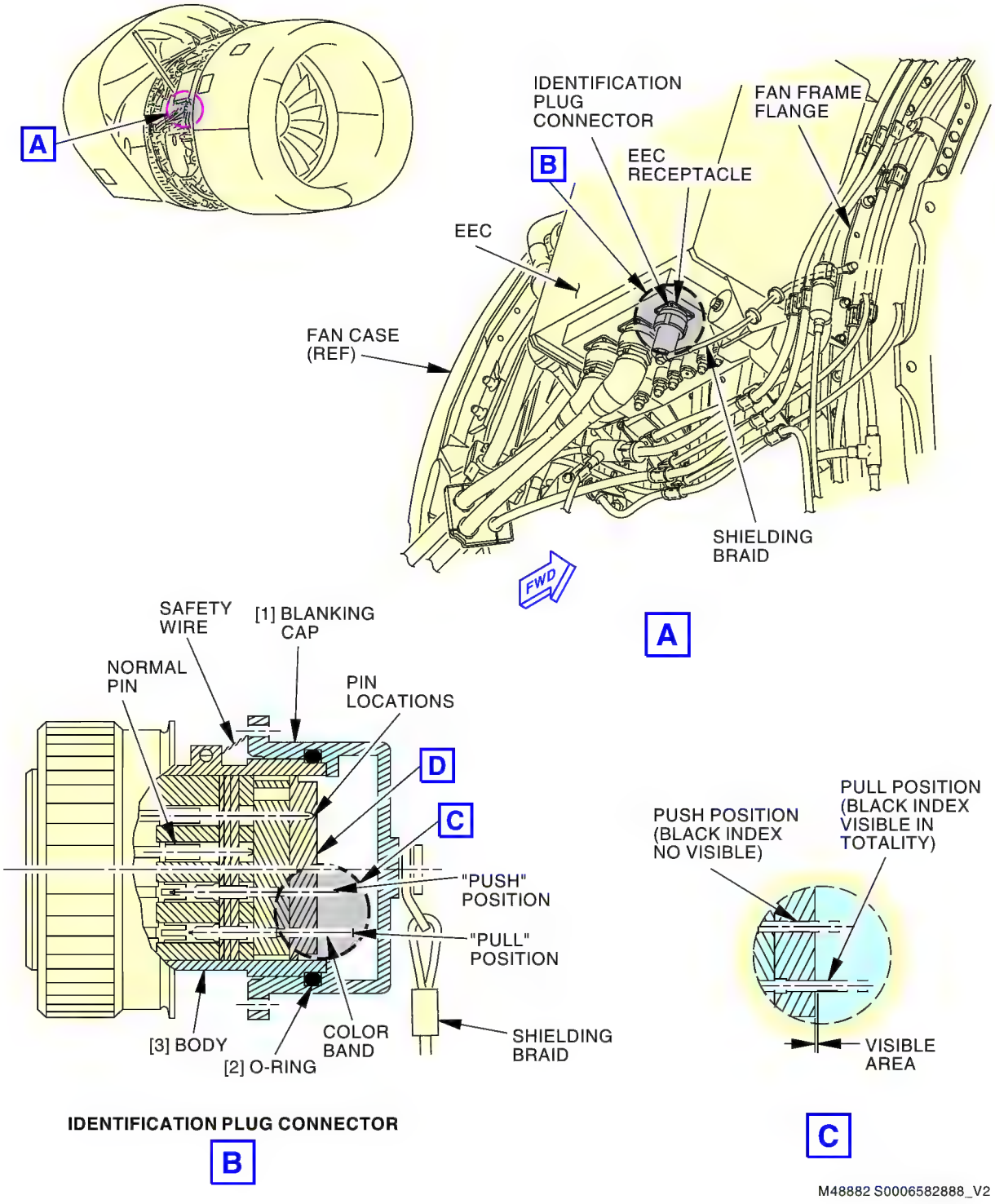
(a) Use vibro-engraving equipment, STD-6617.

SUBTASK 73-21-61-410-005-F00

(4) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

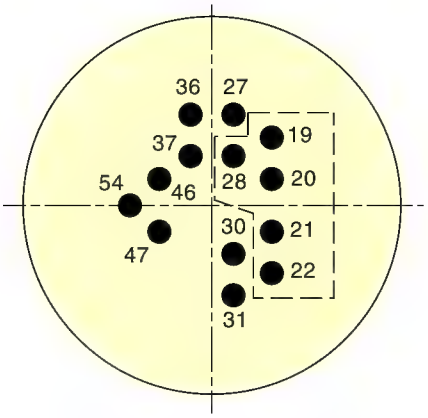
END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



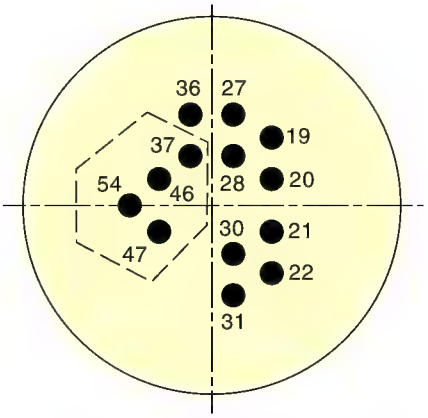
Identification Plug Programming
Figure 501/73-21-61-990-803-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



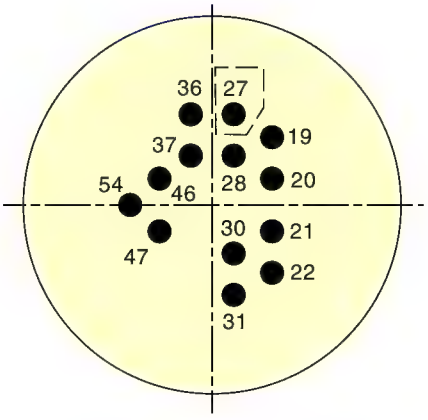
PROGRAMMING OF THE
ENGINE CONFIGURATION

D



PROGRAMMING OF THE N1
MODIFIER CONFIGURATION
(N1 TRIM)

D



PROGRAMMING OF THE PMUX
OPTION CONFIGURATION

D

2406064 S0000556602_V1

Identification Plug Programming
Figure 501/73-21-61-990-803-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

HPTCC SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the HPTCC sensor

(2) The installation of the HPTCC sensor.

TASK 73-21-70-010-801-F00

2. HPTCC Sensor Removal

(Figure 401)

A. General

(1) The HP Turbine Case Temperature (HPTCC) sensor is found on the combustion case at the 4:00 o'clock position.

B. References

Reference	Title
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 73-21-70-840-001-F00

(1) For engine 1, do this step:

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 73-21-70-840-002-F00

(2) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-70-840-007-F00

(3) Make sure that the applicable engine start switch is in the OFF position and install a DO-NOT-OPERATE tag.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

SUBTASK 73-21-70-840-003-F00

WARNING

DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THIS ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. HPTCC Sensor Removal

SUBTASK 73-21-70-020-001-F00

(1) Do these steps to remove the HPTCC sensor:

(a) Disconnect the electrical connector DP0914 [5] from the HPTCC sensor receptacle.

(b) Remove the four bolts [1] and the four washers [2] that hold the HPTCC sensor [6] to the combustion case boss.

(c) Remove the HPTCC sensor [6] from the combustion case boss.

(d) Remove the gasket [3] from the HPTCC sensor.

(e) Visually examine the gasket [3] (TASK 70-30-01-910-802-F00).

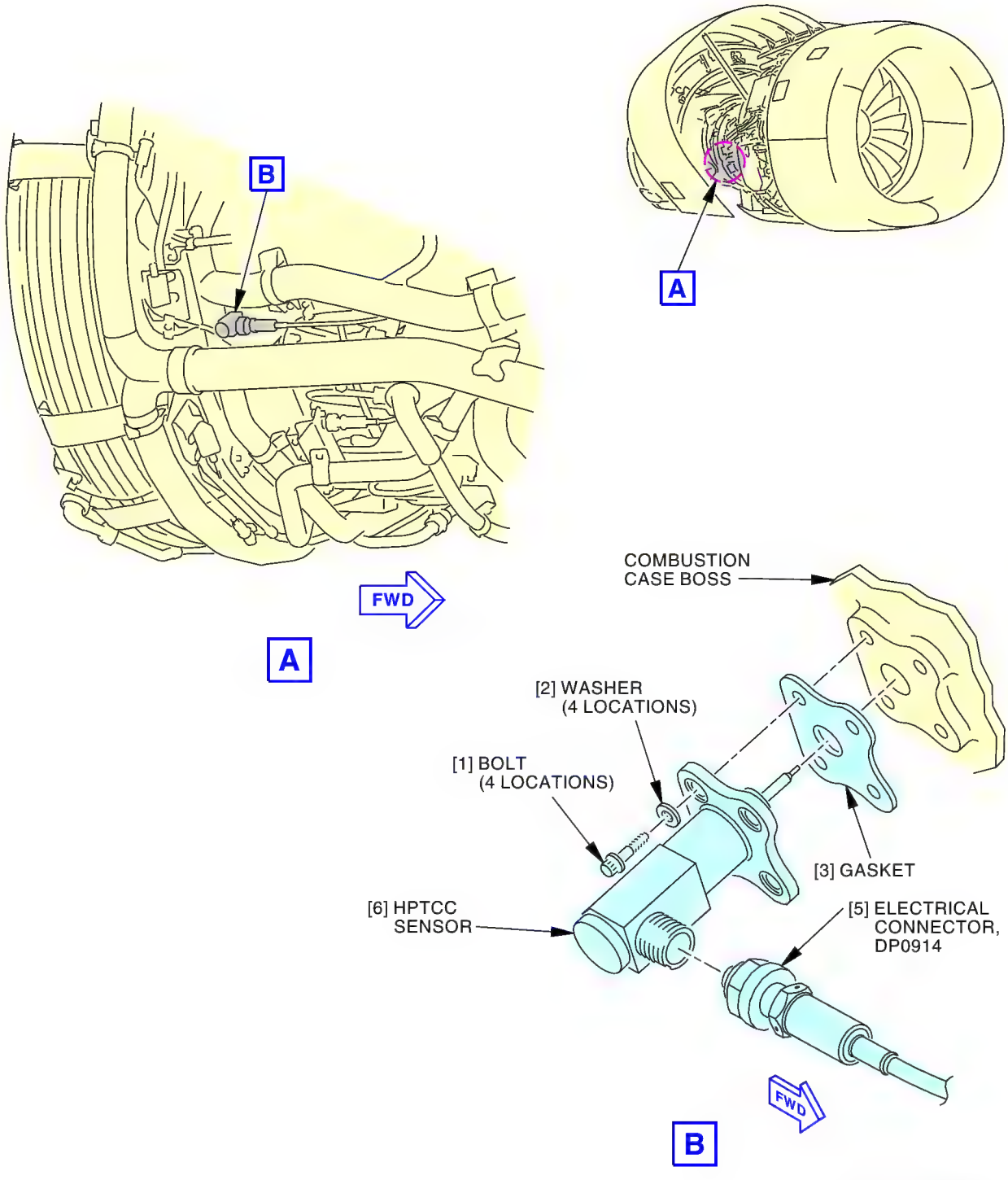
1) If the gasket [3] is not in good condition, replace it.

2) If the gasket [3] is in good condition, keep it for the subsequent installation.

(f) Put a protective cover or non-adhesive (non-residue) tape on the combustion case boss.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



HP Turbine Case Temperature (HPTCC) Sensor Installation
Figure 401/73-21-70-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-21-70-400-801-F00

3. HPTCC Sensor Installation

(Figure 401)

A. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Gasket	73-21-70-01-020	IDC 001-010, 012-999
6	Sensor	73-21-70-01-015	IDC 001-006
		73-21-70-01-017	IDC 001-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. HPTCC Sensor Installation

SUBTASK 73-21-70-020-002-F00

(1) Do these steps to install the HPTCC sensor:

(a) Remove the protective covers or tape from the combustion case boss.

(b) Install the gasket [3] on the HPTCC sensor [6].

(c) Install the HPTCC sensor [6] on the combustion case boss.

1) Make sure that the HPTCC sensor electrical connector points in the forward direction.

(d) Lubricate the threads of the bolts [1] with graphite mineral vaseline, D00601 [CP2101].

(e) Install the four bolts [1] and the four washers [2] to the HPTCC sensor [6].

1) Tighten the bolts [1] to 62-68 pound-inches (7.0-7.7 Newton meters).

(f) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the bolts [1].

(g) Connect the DP0914 electrical connector [5] to the HPTCC sensor receptacle.

(h) Tighten the DP0914 electrical connector to 168-186 pound-inches (19-21 Newton meters).

(i) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the electrical connector.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

F. HPTCC Sensor Installation Test

SUBTASK 73-21-70-840-004-F00

(1) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 73-21-70-840-005-F00

(2) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 73-21-70-840-008-F00

(3) Remove the DO-NOT-OPERATE tag from the engine start switch.

SUBTASK 73-21-70-720-001-F00

(4) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

SUBTASK 73-21-70-840-006-F00

WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL FLOW TRANSMITTER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the Fuel Flow Transmitter (FFT).

(2) The installation of the FFT.

TASK 73-31-01-000-801-F00

2. Fuel Flow Transmitter Removal

(Figure 401)

A. General

(1) The fuel flow transmitter is on the left side of the fan case at the 10:00 o'clock position.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
18	O-ring	73-11-01-01-065	IDC 001-006

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Removal

SUBTASK 73-31-01-840-001-F00

(1) Do these steps to isolate the Fuel Flow Transmitter (FFT):

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure that the engine start lever is in the CUTOFF position.

1) Install a DO NOT OPERATE tag, STD-858, on the applicable engine start lever.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Make sure that the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or when it does not agree with the commanded position; 2) dim when the valve is closed; or, 3) off when the valve is open.

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 73-31-01-010-001-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 73-31-01-680-001-F00

WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) Do these steps to drain the fuel from the system:

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel pump.

(b) Remove the drain plug [17] from the fuel filter cover.

1) Let the fuel drain into the container.

(c) Remove the O-ring [18] from the drain plug [17].

1) Discard the O-ring [18].

WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(d) Lubricate a new O-ring [18] with oil, D00623 [CP5066].

(e) Install the new O-ring [18] on the drain plug [17].

(f) Lubricate the threads of the drain plug [17] with oil, D00623 [CP5066].

(g) Install the drain plug [17] in the fuel filter cover.

1) Tighten the drain plug [17] to 45 in-lb (5 N·m) to 55 in-lb (6 N·m) .

2) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [17].

H. Fuel Flow Transmitter (FFT) Removal

SUBTASK 73-31-01-020-001-F00

(1) Do these steps to disconnect the fuel flow transmitter [4]:

(a) Disconnect the DP0502 electrical connector [6] from the tramsitter receptacle [5].

1) Put protective covers on the DP0502 electrical connector [6] and the tramsitter receptacle [5].

(b) Do these steps to disconnect the fuel inlet tube [13] from the forward end of the fuel flow transmitter [4]:

1) Remove the bolt [14] to disconnect the loop clamp [15] from the bracket [11].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

2) Remove the four bolts [1] that hold the fuel inlet tube [13] to the bracket [2] and the fuel flow transmitter [4].

3) Pull the fuel inlet tube [13] away from the fuel flow transmitter [4].

(c) Put a protective cover on the ends of the fuel inlet tube [13].

SUBTASK 73-31-01-020-002-F00

(2) Do these steps to remove the fuel flow transmitter [4]:

(a) Remove the two bolts [3] and washers [16] that hold the bracket [2] to the fan case bracket [12].

1) Remove the bracket [2].

(b) Remove the four bolts [8] that hold the fuel outlet tube [9] to the bracket [10] and the fuel flow transmitter [4].

(c) Remove the fuel flow transmitter [4] from the fuel outlet tube [9].

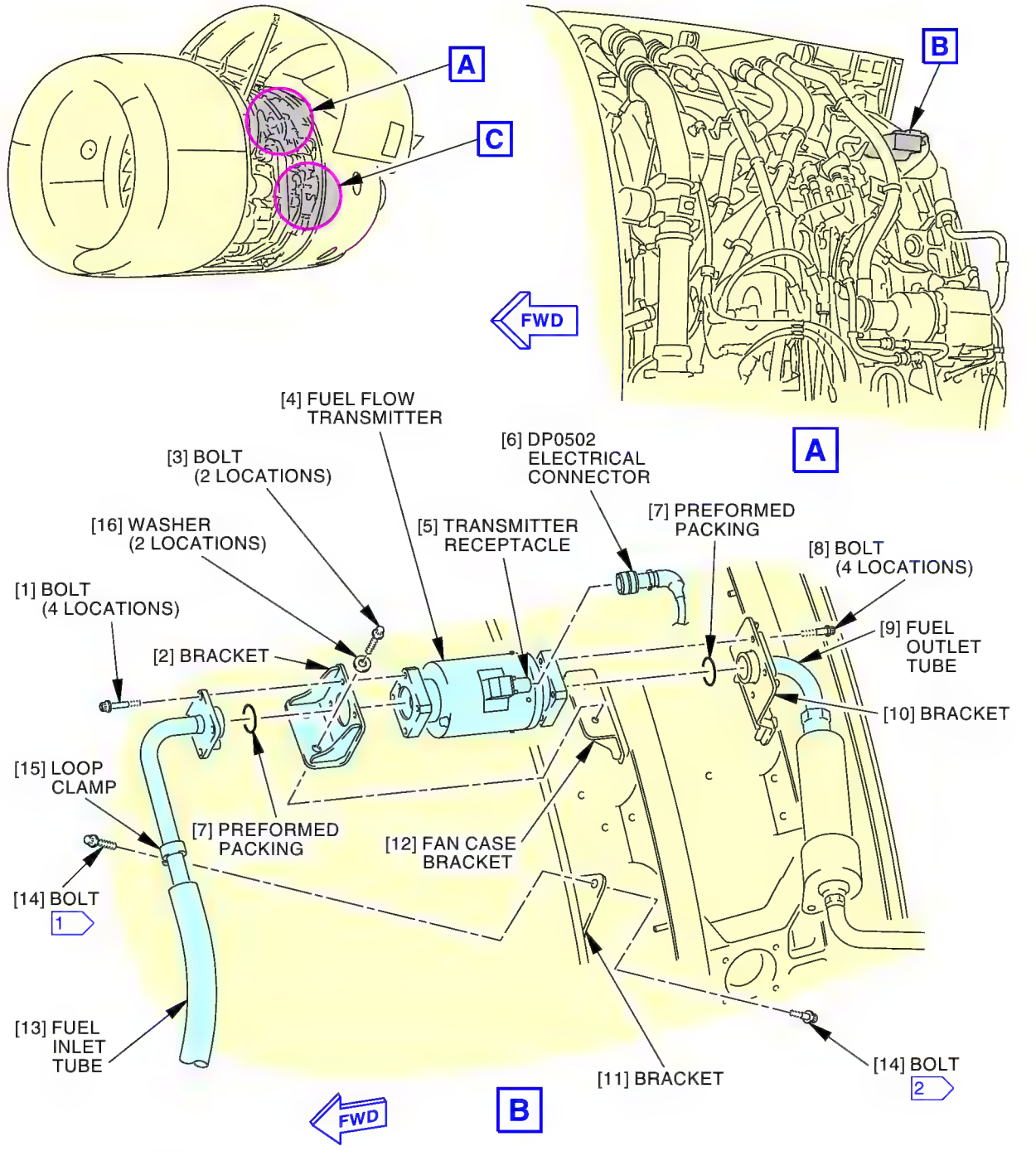
(d) Remove the preformed packings [7] from the ends of the fuel tubes.

1) Discard the preformed packings [7].

(e) Put protective covers on the ends of the fuel outlet tube [9], and the fuel flow transmitter [4].

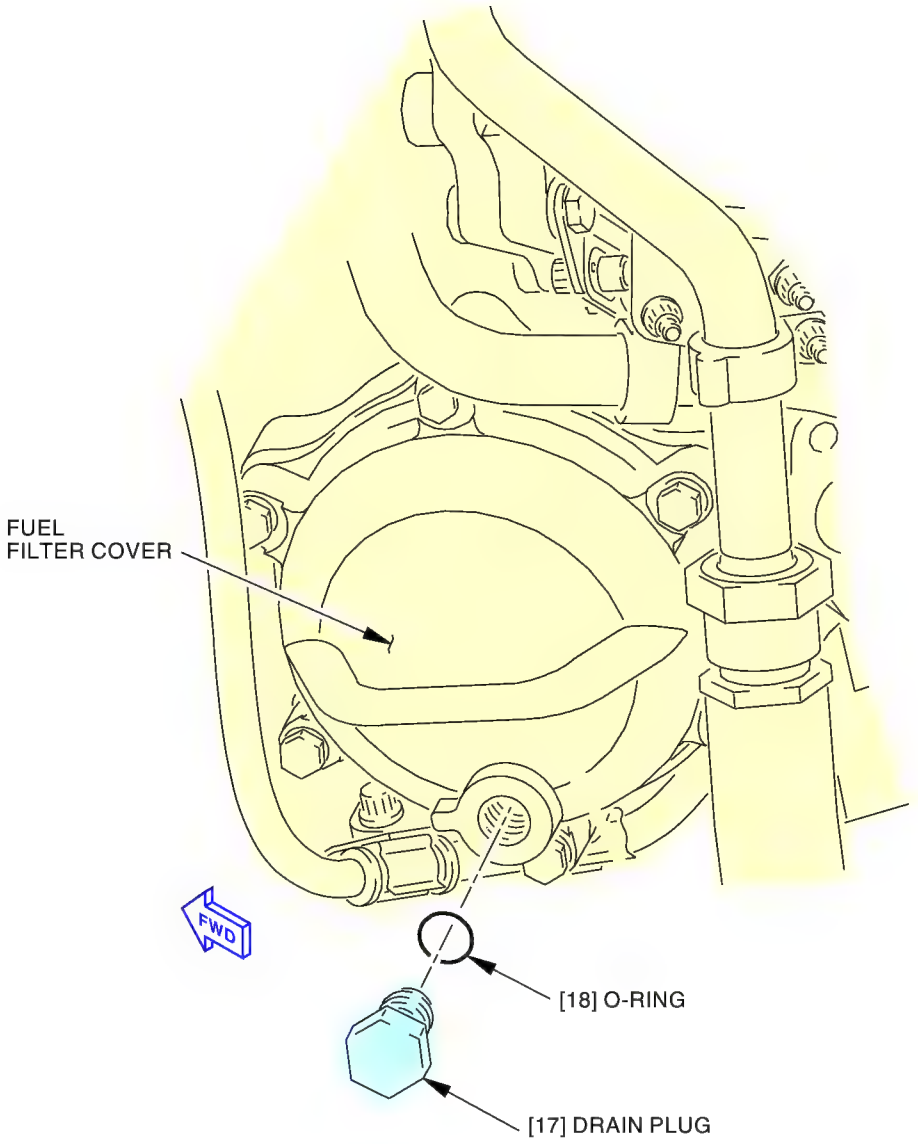
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Flow Transmitter Installation
Figure 401/73-31-01-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



2561963 S0000589213_V2

Fuel Flow Transmitter Installation
Figure 401/73-31-01-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-31-01-400-801-F00

3. Fuel Flow Transmitter Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Fuel flow transmitter	73-31-01-01-065	IDC 001-006
		73-31-01-01A-065	IDC 007-010, 012-999
7	Preformed packing	73-31-01-01-060	IDC 001-006
		73-31-01-01A-060	IDC 007-010, 012-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Procedure

SUBTASK 73-31-01-420-001-F00

(1) Lubricate these items:

WARNING DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(a) Lubricate the new preformed packings [7] with oil, D00623 [CP5066].

(b) Apply graphite mineral vaseline, D00601 [CP2101] to the threads of the bolt [1], bolt [3], bolt [8] and bolt [14].

F. Fuel Flow Transmitter (FFT) Installation

SUBTASK 73-31-01-420-002-F00

(1) Do these steps to loosely install the bracket [2]:

NOTE: To make sure that you can align the bracket, do not tighten the bolts.

(a) Use the two bolts [3] and washers [16] to install the bracket [2] on the fan case bracket [12].

1) Do not tighten the bolts at this time.

SUBTASK 73-31-01-420-003-F00

(2) Do these steps to connect the fuel flow transmitter [4] to the fuel outlet tube [9]:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(a) Remove the protective cover from the fuel outlet tube [9].

(b) Install the preformed packing [7] on the end of the fuel outlet tube [9].

(c) Remove the protective covers from the fuel flow transmitter [4].

(d) Put the fuel flow transmitter [4] in its correct position.

1) Make sure that the fuel flow arrow on the fuel flow transmitter [4] points aft.

2) Make sure that the pin in the aft flange of the fuel flow transmitter [4] goes into the hole in the bracket [10].

3) Make sure that the aft end of the fuel flow transmitter [4] is correctly engaged on the fuel outlet tube [9].

4) Install the four bolts [8] to connect the fuel flow transmitter [4] to the bracket [10] and the fuel outlet tube [9].

a) Tighten the bolts [8] to 98 in-lb (11.1 N·m) to 110 in-lb (12.4 N·m).

SUBTASK 73-31-01-420-004-F00

(3) Do these steps to connect the fuel flow transmitter [4] to the fuel inlet tube [13]:

(a) Remove the protective covers from the fuel inlet tube [13].

(b) Install the new preformed packing [7] on the end of the fuel inlet tube [13].

(c) Make sure that the fuel flow transmitter [4] in its correct position:

1) Make sure that the bracket [2] is correctly aligned with the fuel flow transmitter [4] and the fuel inlet tube [13].

2) Make sure that the forward of the fuel flow transmitter [4] is correctly engaged to the fuel inlet tube [13].

(d) Put the fuel inlet tube [13] in its correct position at the fuel flow transmitter [4].

(e) Install the four bolts [1] to connect fuel flow transmitter [4] to the fuel inlet tube [13] and the bracket [2].

1) Tighten the bolts [1] to 98 in-lb (11.1 N·m) to 110 in-lb (12.4 N·m).

(f) Tighten the bolts [3] that hold the bracket [2] to the fan case bracket [12] to 98 in-lb (11.1 N·m) to 110 in-lb (12.4 N·m).

(g) Install the bolt [14] to connect the loop clamp [15] to the bracket [11].

1) Tighten the bolt [14] to 98 in-lb (11.1 N·m) to 110 in-lb (12.4 N·m).

(h) Remove the protective covers from the electrical connector and the receptacle of the fuel flow transmitter [4].

(i) Connect the DP0502 electrical connector [6] to the tramsitter receptacle [5].

G. Put the Airplane in a Serviceable Condition

SUBTASK 73-31-01-840-003-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

H. Fuel Flow Transmitter Installation Test

SUBTASK 73-31-01-730-001-F00

(1) Do these steps for the Fuel Flow Transmitter (FFT) installation test:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(b) Do the tests that show in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00):

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

FUEL FILTER DIFFERENTIAL PRESSURE SWITCH OR FUEL FILTER CLOGGING INDICATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) Fuel filter differential pressure switch or fuel filter clogging indicator removal

(2) Fuel filter differential pressure switch or fuel filter clogging indicator installation.

TASK 73-34-01-000-801-F00

2. Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal

(Figure 401, Figure 402)

A. General

(1) The Fuel Filter Differential Pressure Switch (FFDPS) or the Fuel Filter Clogging Indicator (FFCI) is on the fuel pump fuel filter housing.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 73-34-01-840-001-F00

(1) Do these steps to isolate the fuel from the fuel pump:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

(b) Make sure the engine start lever is in the CUTOFF position.

1) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

(c) Make sure the ENG VALVE CLOSED (engine fuel shutoff valve) light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the engine fuel shutoff valve has three positions: 1) bright when the valve is in transition or it does not agree with the commanded position; 2) dim when the valve is closed; or, 3) off when the valve is open.

(d) Make sure the SPAR VALVE CLOSED light on the fuel control panel (P5 overhead panel) is dim.

NOTE: The light for the spar valve has three positions: 1) bright when the valve is in transition or it does not agree with the commanded position; 2) dim when the valve is closed; or, 3) off when the valve is open.

(e) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

1) Make sure that the BAT switch on panel P5-13 is set to OFF and install a DO-NOT-OPERATE tag.

SUBTASK 73-34-01-840-002-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Removal

SUBTASK 73-34-01-680-001-F00

WARNING

DO NOT GET FUEL IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. KEEP THE FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do these steps to drain the fuel:

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054 below the fuel pump package.

(b) Remove the drain plug [10] from the fuel filter cover [8].

(c) Let the fuel drain in the container.

(d) Remove the O-ring [9] from the drain plug [10].

1) Discard the O-ring [9].

SUBTASK 73-34-01-020-001-F00

(2) Do these steps to remove the FFDPS [3] or the FFCI [4]:

(a) Disconnect the electrical connector, DP0803 [5] from the FFDPS receptacle or from the FFCI receptacle.

1) Install protective covers on the electrical connector, DP0803 [5] and the FFDPS receptacle or the FFCI receptacle.

(b) Remove the two bolts [6] and the two washers [7] that hold the FFDPS [3] or the FFCI [4] to the fuel filter housing.

(c) Remove the FFDPS [3] or the FFCI [4].

(d) Put a protective cover on the fuel filter housing.

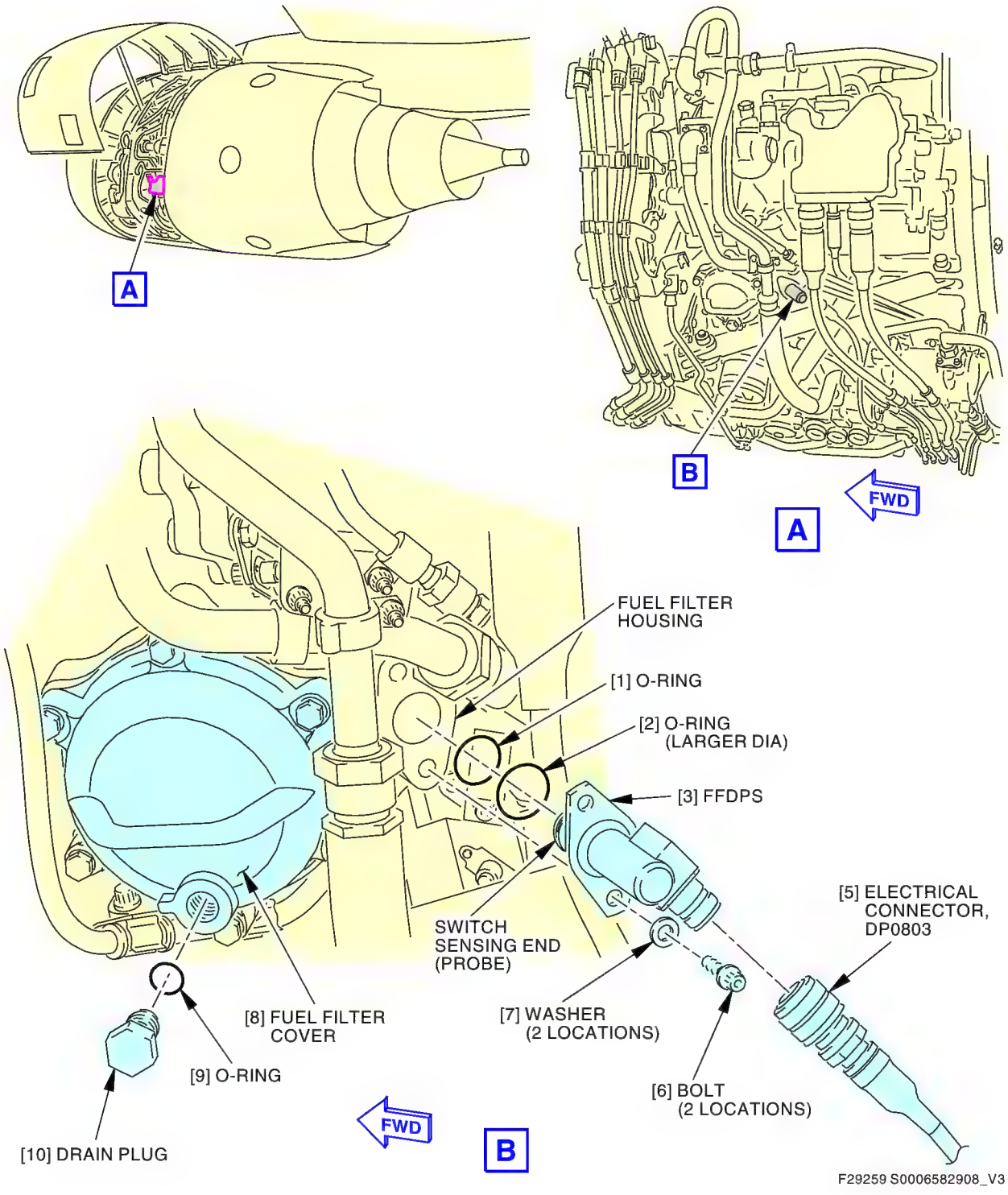
(e) Remove the O-ring [1] and O-ring [2] from the FFDPS [3] or the FFCI [4].

1) Discard the O-rings.

(f) Put a protective cover on the probe of the FFDPS [3] or on the probe of the FFCI [4].

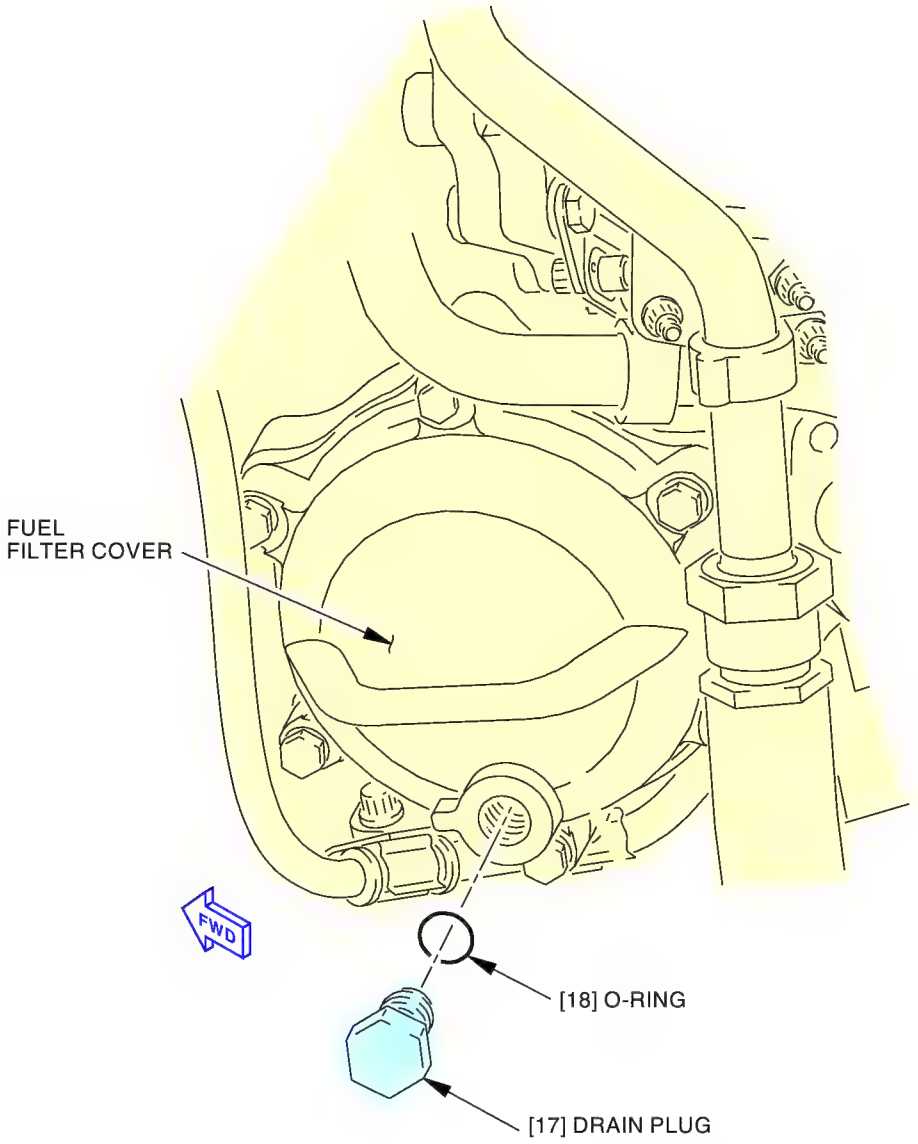
——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Filter Differential Pressure Switch Installation
Figure 401/73-34-01-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



2561963 S0000589213_V2

Fuel Filter Clogging Indicator Installation
Figure 402/73-34-01-990-802-F00

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

TASK 73-34-01-400-801-F00

3. Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation

(Figure 401, Figure 402)

A. General

(1) The Fuel Filter Differential Pressure Switch (FFDPS) or the Fuel Filter Clogging Indicator (FFCI) is on the fuel pump fuel filter housing.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00601 [CP2101]	Vaseline - Graphite Mineral	CFM CP2101
D00623 [CP5066]	Oil - Fuel System, Corrosion Preventive	MIL-PRF-6081, Grade 1010
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	CFM CP8001, AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	CFM CP8006, M50 TF 9 CL-A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	73-34-01-01-040	IDC 001-006
		73-34-01-01A-060	IDC 007-010, 012-999
2	O-ring	73-34-01-01-045	IDC 001-006
		73-34-01-01A-065	IDC 007-010, 012-999
3	FFDPS	73-34-01-01-050	IDC 001-006
		73-34-01-01A-070	IDC 007-010, 012-999
4	FFCI	73-34-01-01A-070	IDC 007-010, 012-999
9	O-ring	73-11-01-01-065	IDC 001-006
		73-11-01-01A-115	IDC 007-010, 012-999
10	Drain plug	73-11-01-01-060	IDC 001-006
		73-11-01-01A-110	IDC 007-010, 012-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation

SUBTASK 73-34-01-840-003-F00

(1) Prepare for the installation:

(a) Lubricate the threads of the two bolts [6] with graphite mineral vaseline, D00601 [CP2101].

(b) Remove the protective cover from the probe of the FFDPS [3] or the FFCI [4].

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

(c) Do these steps to install the O-ring [2] and the O-ring [1] on the FFDPS [3] or the FFCI [4]:

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

1) Lubricate the two O-rings with oil, D00623 [CP5066].
2) Install O-ring [2].
   NOTE: The two O-rings do not have the same diameter. Install the larger diameter O-ring first.
3) Install O-ring [1].

(d) Remove the protective cover from the fuel filter housing.

SUBTASK 73-34-01-420-001-F00

(2) Do these steps to install the FFDPS [3] or the FFCI [4] on the fuel filter housing:

(a) Put the FFDPS [3] or the FFCI [4] in its correct position on the fuel filter housing.

(b) Install the two bolts [6] and the two washers [7] that hold the FFDPS [3] or the FFCI [4] to the fuel filter housing.

1) Tighten the two bolts [6] to 85-90 pound-inches (9.5-10.5 Newton meters).

(c) Remove the protective covers from the electrical connector, DP0803 [5] and the FFDPS receptacle or the FFCI receptacle.

(d) Connect the electrical connector, DP0803 [5] to the FFDPS receptacle or the FFCI receptacle.

NOTE: Make sure that the J8 harness (electrical connector, DP0803 [5]) is Post SB 73-0202 before the installation of the FFCI [4].

SUBTASK 73-34-01-420-002-F00

(3) Do these steps to install the drain plug [10] on the fuel filter cover:

WARNING
DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

(a) Lubricate a new O-ring [9] with oil, D00623 [CP5066].

(b) Install the O-ring [9] in the groove of the drain plug [10].

(c) Lubricate the threads of the drain plug [10] with oil, D00623 [CP5066].

(d) Install the drain plug [10] on the fuel filter cover [8].

1) Tighten the drain plug [10] to 45-55 pound-inches (5.0-6.2 Newton meters).

(e) Install safety wire, G02345 [CP8001] or cable, G50065 [CP8006] on the drain plug.

G. Fuel Filter Differential Pressure Switch or Fuel Filter Clogging Indicator Installation Test

SUBTASK 73-34-01-840-004-F00

(1) Do these steps to prepare for the FFDPS or the FFCI installation test:

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

1) Remove the DO-NOT-OPERATE tag from the BAT switch on panel P5-13.

(b) For engine 1, do this step:

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

(c) For engine 2, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

(d) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 73-34-01-720-001-F00

(2) Do the FFDPS or the FFCI installation test:

(a) Put the engine Start Switch in the CONT position.

(b) Make sure that the FILTER BYPASS light does not show on the Fuel Panel, P5.

(c) For engine 1, do this step:

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

(d) For engine 2, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

(e) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

(f) Put the engine Start Switch in the OFF or AUTO position after testing.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details